Operating Manual

Pilot Line Manager 4.9

Version C

METTLER TOLEDO

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1 Safety Instructions

1.1 Explanation of Symbols

The following symbols and notes are warning signals of possible damage to person or property or assist you as guidelines.

DANGER

This symbol can be found in the operations manual at all references concerning operational safety, if not adhered to there will be danger to body and life of persons.

Always observe the instructions carefully and perform with extreme attention and wariness.

Note

This symbol indicates the appropriate handling of PCE-components.

1.2 Basic Safety Measures

For safe operation of the PCE components the following points must be observed:

- The components must be mounted on a stable, mechanical, permanently fixed attachment.
- During operation, the components must be protected against the influence of external light.
- The power supply of the components is provided by 24 V DC-technique and supplied by an external power source. All necessary safety measures for this type of technique are to be adhered to.

The device may only be operated by persons trained on and authorized to use the device, who are familiar with the Instruction Manual and are able to operate the device accordingly.

DANGER

Lightning causes damage to the eyes

Do not look into the lightning without adequate eye protection

To ensure safe operation of the system, repeated inspections are to be carried out on all the relevant safety parts, and particularly the above-mentioned points and Instruction Manual are to be observed.

1.3 Operator's Duty to Exercise Due Care

The PCE components are developed and constructed under consideration of the harmonized norms to be adhered to, as well as further technical specifications. They meet the latest technical requirements and ensure the highest level of security during operation.

The safety of the system during everyday operation can, however, only be ensured if all the necessary, relevant measures are taken. Planning these measures and controlling their implementation is part of the system operator's responsibility for exercising due care.

The operator must ensure that:

- the system is used in accordance with the stipulations,
- the system is only operated in perfect, fully functional condition,
- the Instructions Manual is always in a readable condition and is available, in full, where the machine is installed,
- only respectively qualified and authorized personnel operate and service the system,
- this personnel is instructed on a regular basis on all the relevant aspects concerning work safety, and that they are familiar with the Instruction Manual and the safety instructions it contains,
- all the system features relating to safety are carefully tested at regular intervals,
- the higher the safety risks are, protected against by this device, the more frequent regular inspections must be carried out.

1.4 Protection against Injuries Caused by Electrical Power

DANGER

The system is operated with supply voltage!

- Contact with live parts can cause perilous state of shock and severe burns.
- Operate system with duly mounted housing only.
- Unplug electric supply prior to cleaning and care.
- In case of liquid has been spilled on the system, immediately switch off the system and unplug electric supply.

1.5 Protection against Injuries Caused by Mechanical Impact

DANGER

Danger of injury by movable and rotating parts!

- Wear adequate personal protective equipment.
- Switch off machine prior to mechanical adjustment work.

1.6 Transport, Installation and Start-up

During transport it must be ensured that the device is packed and transported as such that it is protected against moisture and impact.

When installing the device in an industrial environment, this should typically be done where the adverse effects of dust, moisture, temperature and vibration are at their very lowest.

Safe operation of the device can only be guaranteed if specially trained personnel have conducted the installation and start-up.

DANGER

Danger of tripping and tumble accidents!

- Tripping- and tumble accidents lead to severe injuries!
- Install machine connections (cables) adequately in order to avoid tripping!

DANGER

Rotating axes!

- Rotating axes! Can pull in and tear hair, clothing and jewelry.
- Do not operate machine with opened housing!
- Keep away long hair, loose clothing, jewelry etc. from machine!

2 About This Manual

2.1 Scope and Audience

This manual describes how to use and configure the Pilot line Manager (PLM). It is intended for personnel who operate the PLM in order to control a vision inspection system for packing lines. This includes:

- Operators
- Supervisors
- Administrators
- Engineers

During production the PLM can control the following elements:

- Manual Aggregation Station
- Shipping Case Station
- Advanced Bundle Station
- Datamatrix Station

This includes the corresponding devices like cameras, printers and plc.

For information on how to use the PLM in combination with an ERP system, read the Pilot Site Manager (PSM) Operating Manual.

2.2 Technical Support and Trainings

At our website you find the latest information about our products and services. Please visit: www.pharmacontrol.de

For any requests please do not hesitate to contact us via email or phone:

Service line: +49 (0) 6251 85 45 – 555 / Email: mtpce.service@mt.com

We provide extensive seminars and trainings that will help you get the most from your equipment. Our application seminars focus on industry and application issues. Individual trainings can be arranged on demand. Please contact us to request your individual training.

2.3 Formatting and Meaning

The formats used in this manual have determined meanings. If they are used they denote the following:

Formatting

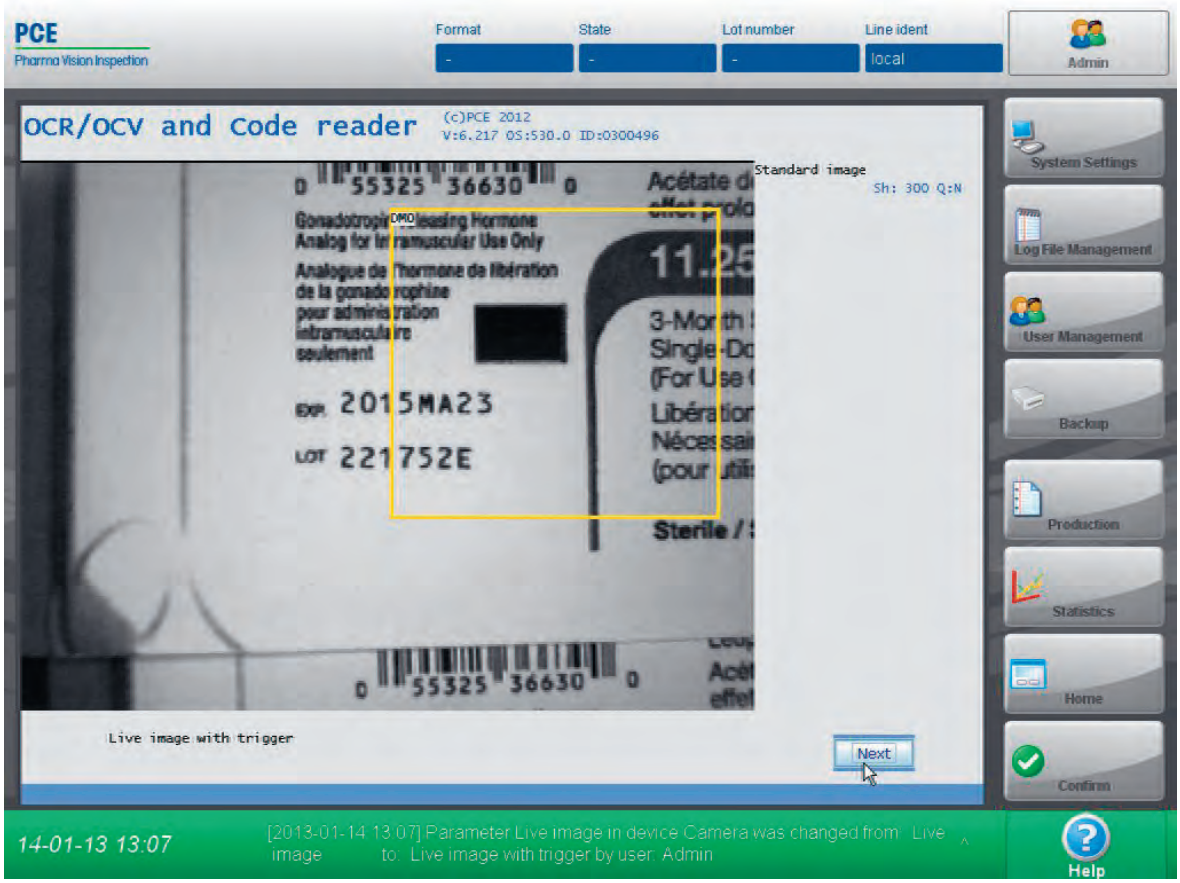
Format	Meaning
PC	Menu Paths, Buttons at the screen surface, fixed tab names, names of screens and dialogs
'apostrophes'	Names of fields, columns at the home screen, check-boxes, names of modes, parameters
<angle brackets>	Wildcard for usernames, wildcard for tab names of devices (individual names can be assigned)

2.4 Availability of Buttons and Screens

Always remember that many functionalities of the PLM need certain user rights. This means if your screen does not offer buttons shown in the user manual it is likely that you need more user rights which have to be assigned to your profile by an administrator. The usual way to assign user rights is to add a user to a user group. Thus the user obtains all user rights belonging to that group.

2.5 How to Use Screenshots

Below each screen you see the path how to get there[1]. Additional actions that are to perform at this screen are described below the screen[2]. Wildcard buttons[3] and actions at the path[4] are placed in brackets. See the following example:



[1]Figure 2-1: `Home>(<select smart camera bar>)`[3] `> Menu > Product management > New product > (enter product name)`[4] `> Enter (at the keyboard) > Live Image`

[2] Press `Next`.

3 Functions Overview (A-3)

3.1 Introduction

The Pilot Line Manager PLM is the line management component of the Pilot Software Suite. The PLM controls and administrates centrally at one line the devices such as printers, cameras and scanners.

During start of production, the connected devices are provided with static data (e.g. LOT and EXP). As an option, a database connection for serialization is possible (this ensures a distinct traceability of the single unit from the manufacturer to the patient. The operator is able to manage with minimum effort all devices at the line; the provided settings are stored in the central database.

In case of Serialization/Aggregation:

A clear traceability of the individual packaging from the manufacturer right up to the patient is guaranteed.

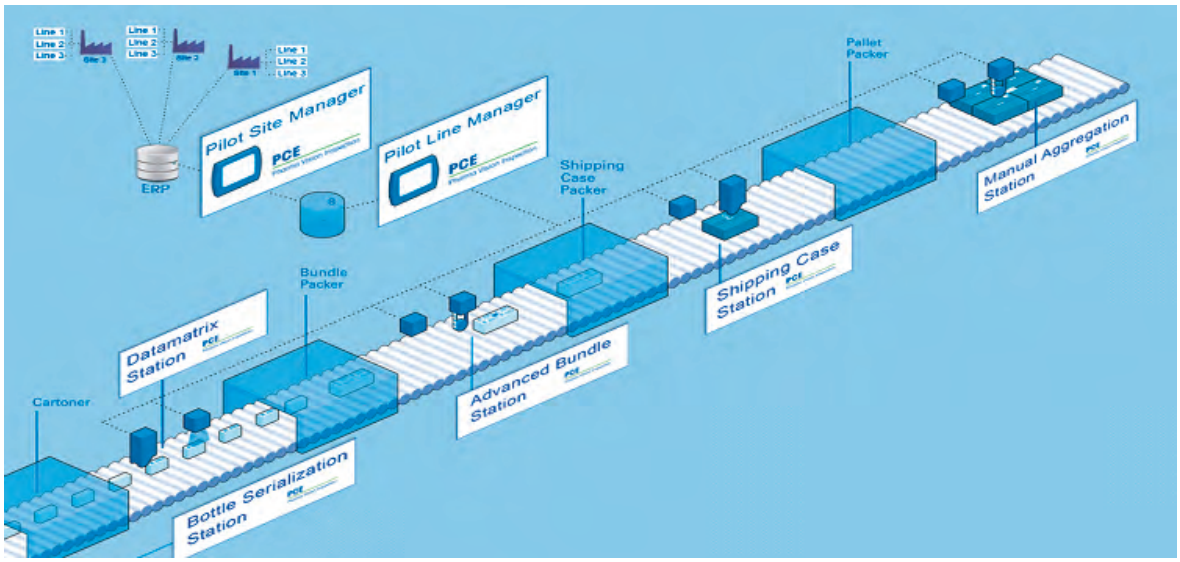


Figure 3-1: Production line track and trace

3.2 Marking and Capturing of Items (Folding Boxes etc.)(A-3.3.2)

The individual packaging units are typically marked via inkjet or laser printer. Thereafter they are verified immediately via a multifunctional Smart Camera as to correct data content and readability.

In case of Serialization/Aggregation:

The status of every unit will be registered in order to ensure traceability. All units classified as bad will be ejected immediately and only units classified as good proceed the packaging process.

The counter readings produced during the evaluation process are displayed in real-time and are stored in the database after stop or completion of the production.

Note

Datamanagement complies with 21 CFR Part 11 directives

Data management and storage as well as operation of the software are in compliance with the 21 CFR Part 11 directives.

3.3 Link of Control Devices (A-3.3.3)

The monitoring devices are connected directly via LAN interface, if there is one. If there is no LAN interface, devices are then connected via RS232 to LAN boxes. To the extent that this is feasible, devices are connected in accordance with the current directives of the VDMA-Standard "VDMAXML_P". An intelligent component assures compatibility for units without VDMAXML_P capabilities.

If their interfaces are exposed, new devices can be rapidly and easily integrated with a custom-developed modular concept. The PLM is able to communicate with other devices via Ethernet, USB and RS232.

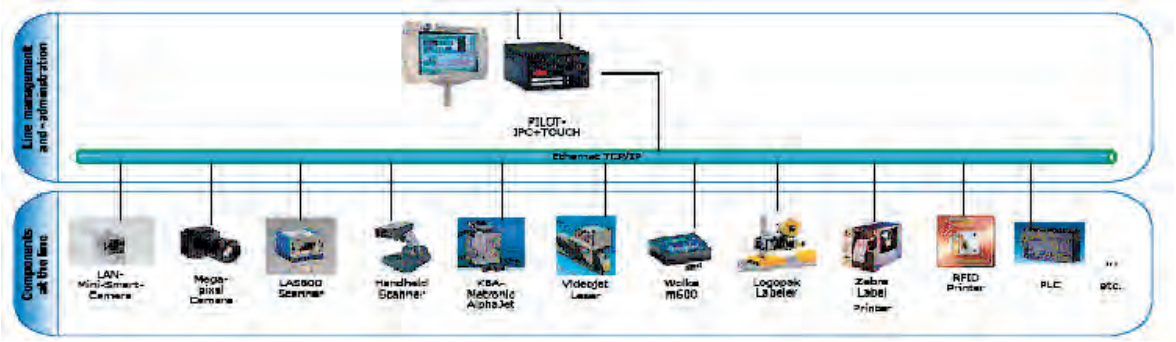


Figure: Link of devices

Note

Compliance with the 21 CFR Part 11

Data management and storage as well as operation of the software are in compliance with the 21 CFR Part 11 directives.

3.4 Level Definitions (A-3.3.4)

This is an overview of the control levels at the aggregation/serialization process. The following figure is an example how a visual inspection production can basically look like. The detailed structure of your system is defined at the functional specification.

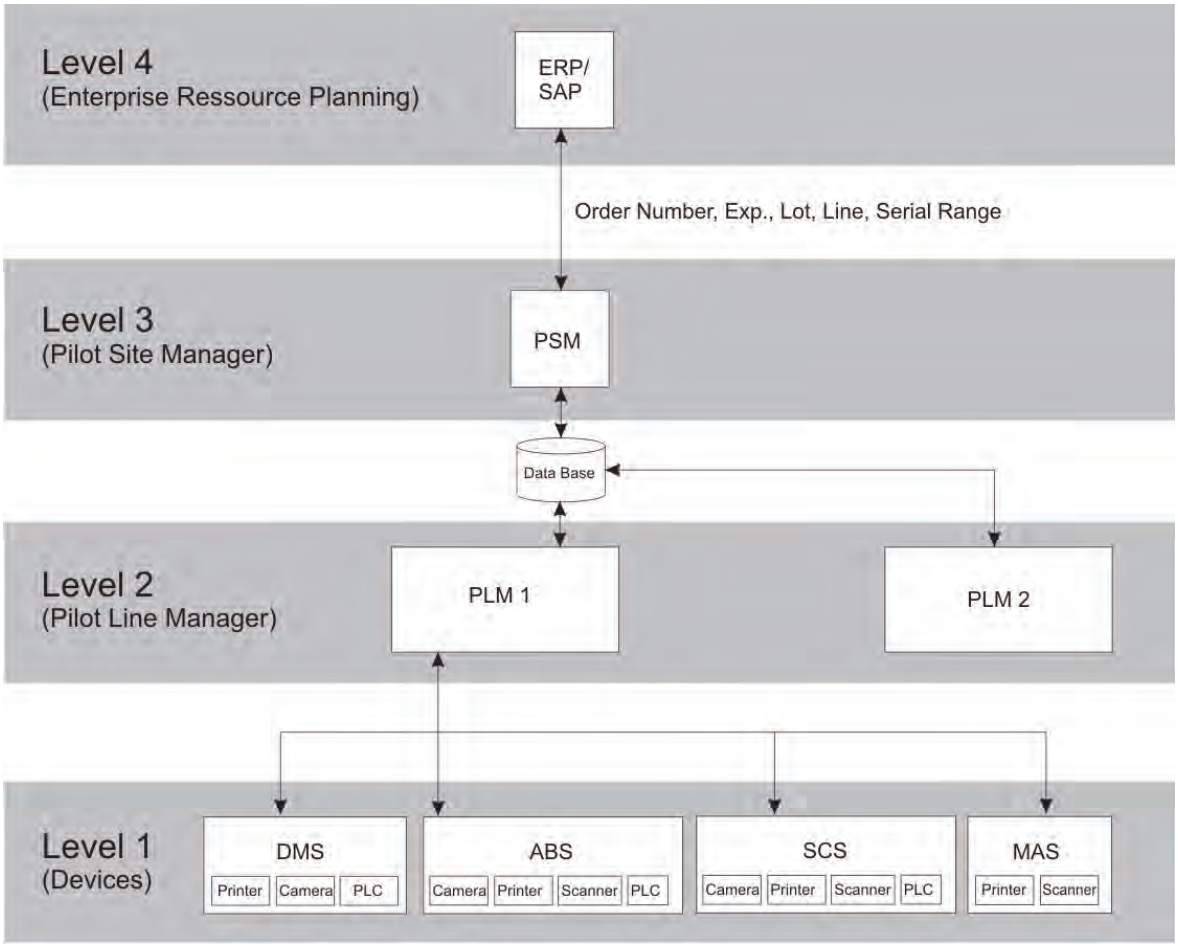
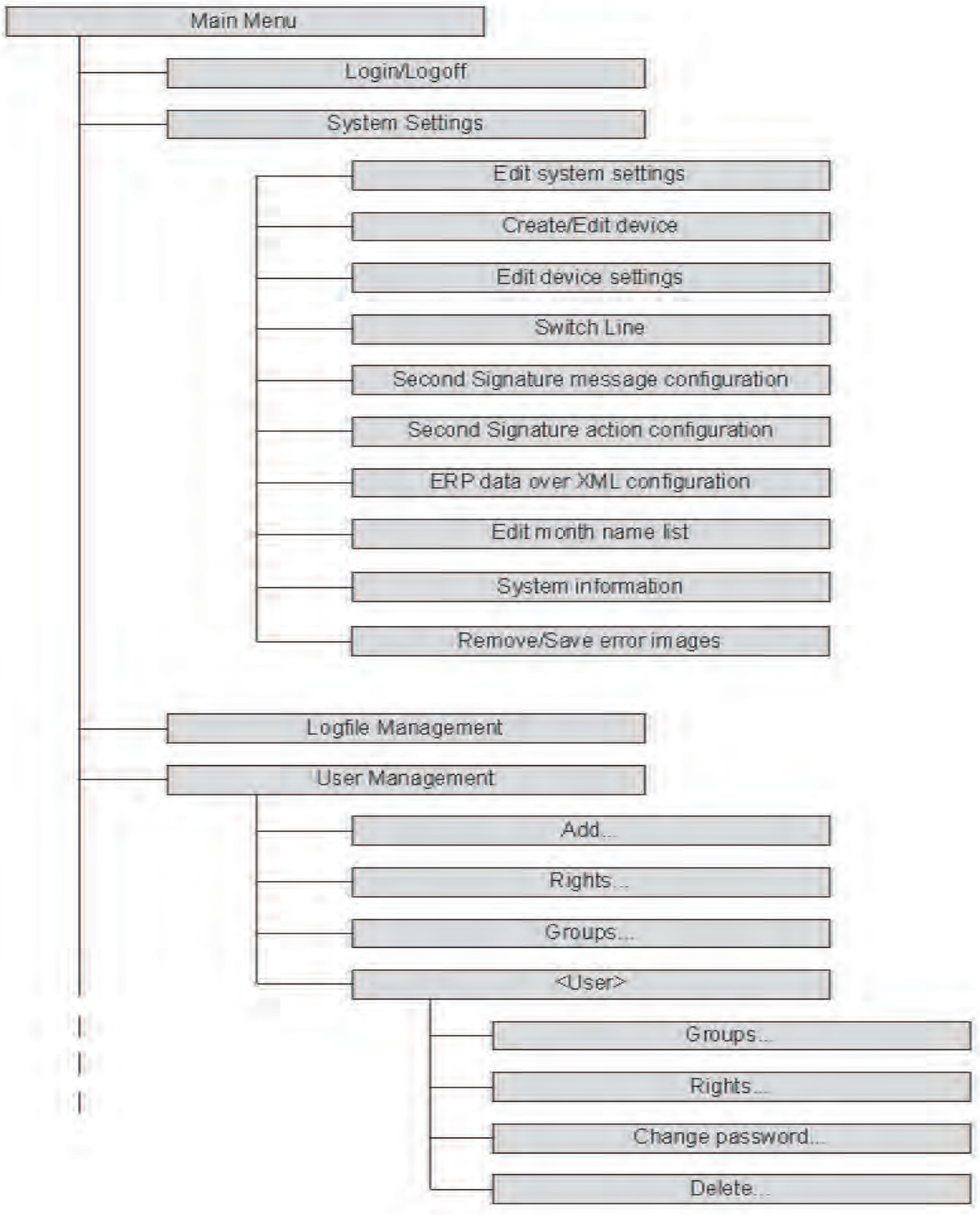


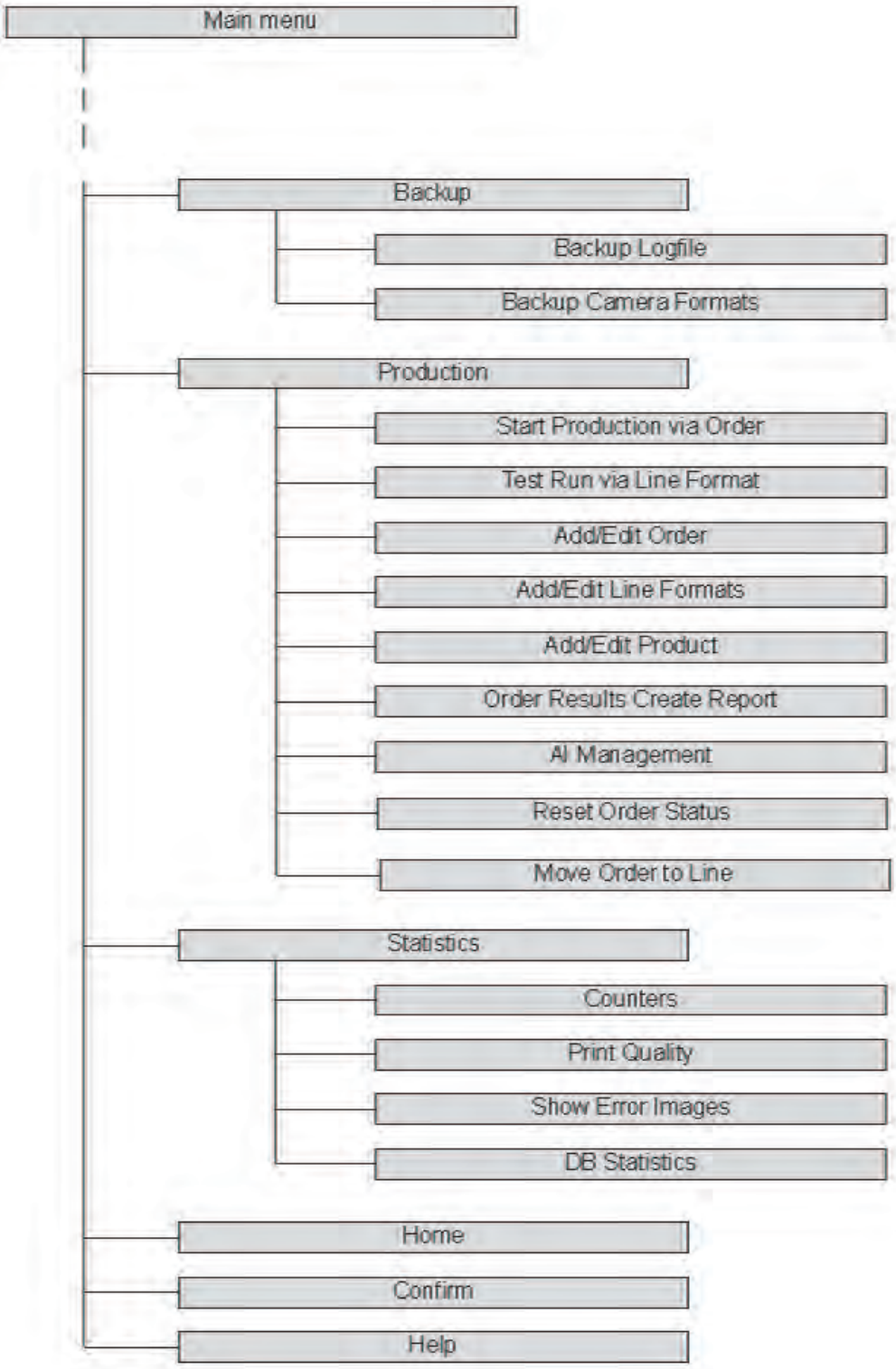
Figure: Control levels at the aggregation/serialization process

4 The PLM Workspace and Usage

4.1 Menu Tree Overview

The menu tree shows the maximum possible menu structure of the system. Depending on user rights, certain menus may not be visible.





4.2 Screen Elements Overview

The following figure shows the appearance of the PLM Interface. The example shows the `device settings` screen.

Figure: `System Settings > Edit device settings > (<PLC tab>)`

Pos.	Name	Function
1	Program head	Statistical data of the production (current format, status of production, batch number and line name) as well as the registered user
2	Login / Logout Button	By clicking this button you can log in or log off.
3	Menu panel	With these buttons you navigate to the main functions. These buttons are fixed.
4	Sub Navigation	Here the buttons for current interaction are displayed. If an alarm occurs it is displayed here.
5	-	Here you can navigate to additional options if applicable.
6	Tab menu	The tab menu allows navigating to specific information and device settings. Note: The names of the device tabs can be assigned freely (see chapter 6.2.3.1 (page 36)).
7	Status Bar	At the status bar error messages (red), warnings (yellow) and modifications, e.g. of line format, user log-in and log-off, start/stop of production (green) will be displayed. If several messages are displayed, this will be signaled by ^ after the message. By clicking the status line the information history will be called. The current date and time are always visible in the left corner of the status bar.

4.3 Starting the PLM (A-3.4.4)

To start the PLM and the line follow the sequence listed below:

1. Turn on the power supply of the stations and devices without having the PLM installed. For example this can be MAS, SCS, ABS. Wait until software is completely up and running.
2. Turn on the power supply of the stations having the PLM installed. This is usually only the DMS but can also be another station. Wait until software is completely up and running.

To automate this delay the startup waiting time at the PLM has to be configured. Press `System Settings > Edit System Settings`. At the parameter 'WT01 Startup waiting time' set a checkmark at the checkbox and set the waiting time to 20 seconds. See the following screen:

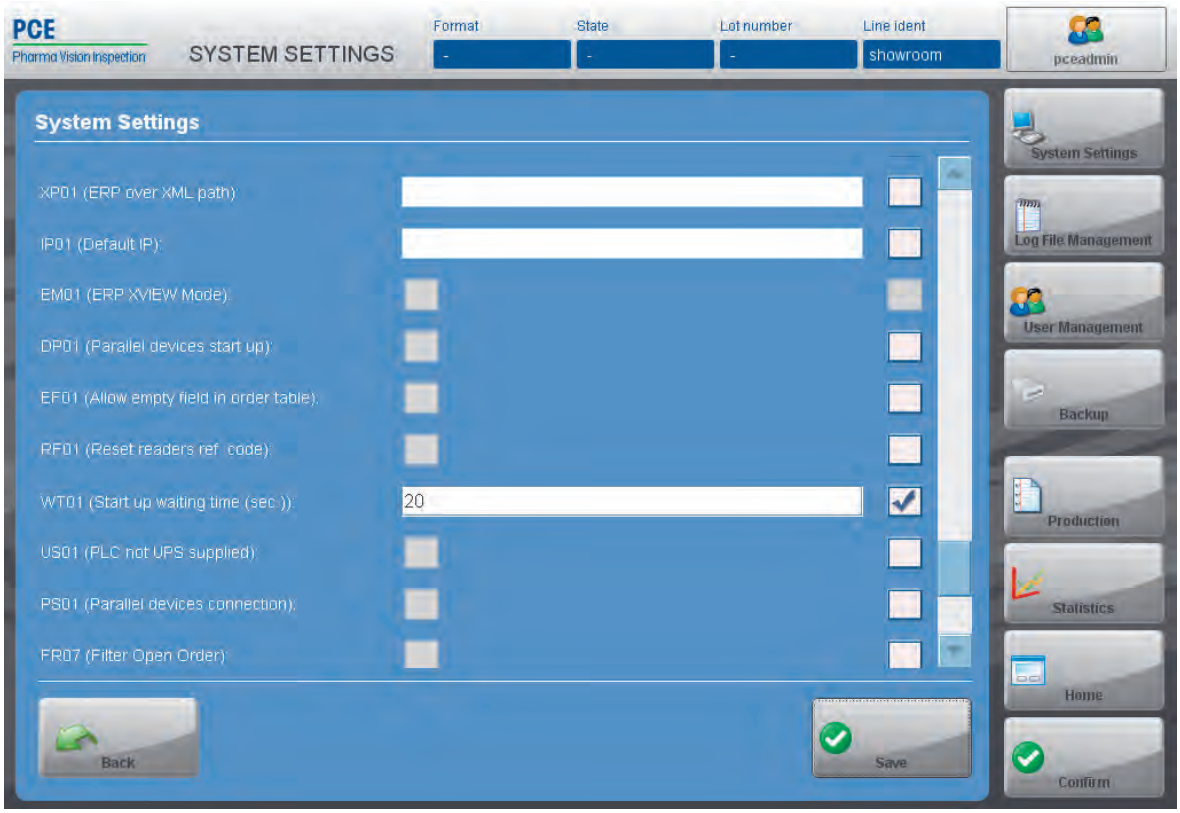


Figure: System Settings > Edit system settings (Start up waiting time)

Note

Meet sequence of turning on stations

It is essential to start at first stations and devices without having the PLM installed. If not retaining the sequence an IP-address conflict can occur.

4.4 Log-in and Log-off (A-3.4.3)

All rights in the PLM are user dependent. Different users see different screens and can perform different tasks in the PLM. After starting the Pilot Line Manager you have to log-on in order to get access to further functions in the menu panel on the right hand side of the screen.

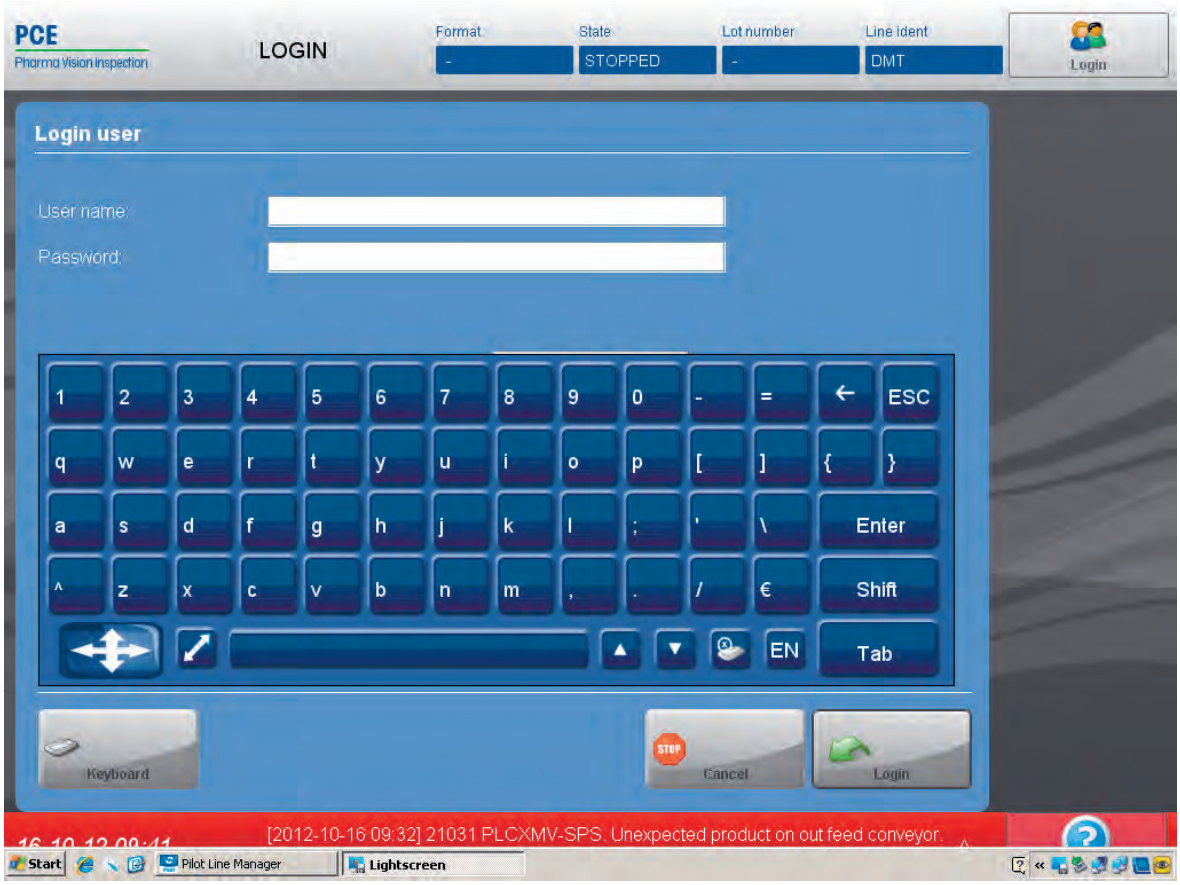
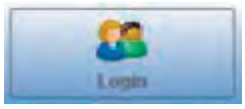


Figure: `Login`



Upon clicking the log-in button in the upper right corner the input of a user name and password will be necessary. Depending on the rights of the registered user further functions will be available (see chapter 5 (page 25)).

The name of the presently registered user will be displayed on the button (here <Administrator 1>)

Note

Change password if required

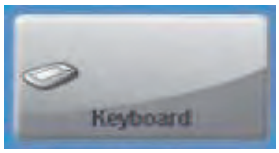
Upon first login, the user may be asked to change his password (depending on the system settings).

Change of User

When a different user wants to operate the Pilot Line Manager, the previous user will have to log off first. It is guaranteed herewith that the created log and production files can be assigned to a specific user.

Setting auto log-off time

An auto log-off can be adjusted optionally. The user will be logged-off automatically after a preset time, as long as he is not entering any data at the terminal. This functionality can be set under the system settings.



If using an external keyboard the keyboard displayed on the screen can be switched off for the duration of the registration of the user by pressing `Keyboard`.

Note

Screen Keeyboard can be disabled

- The screen keyboard can be disabled during registration of a user by pressing `keyboard` (see chapter on logging in and logging off). It can also be switched off globally for all users (see chapter on system settings)
- (Using `Disconnect`, all connected devices are disconnected. This is a debug function for the PCE maintenance technician!)

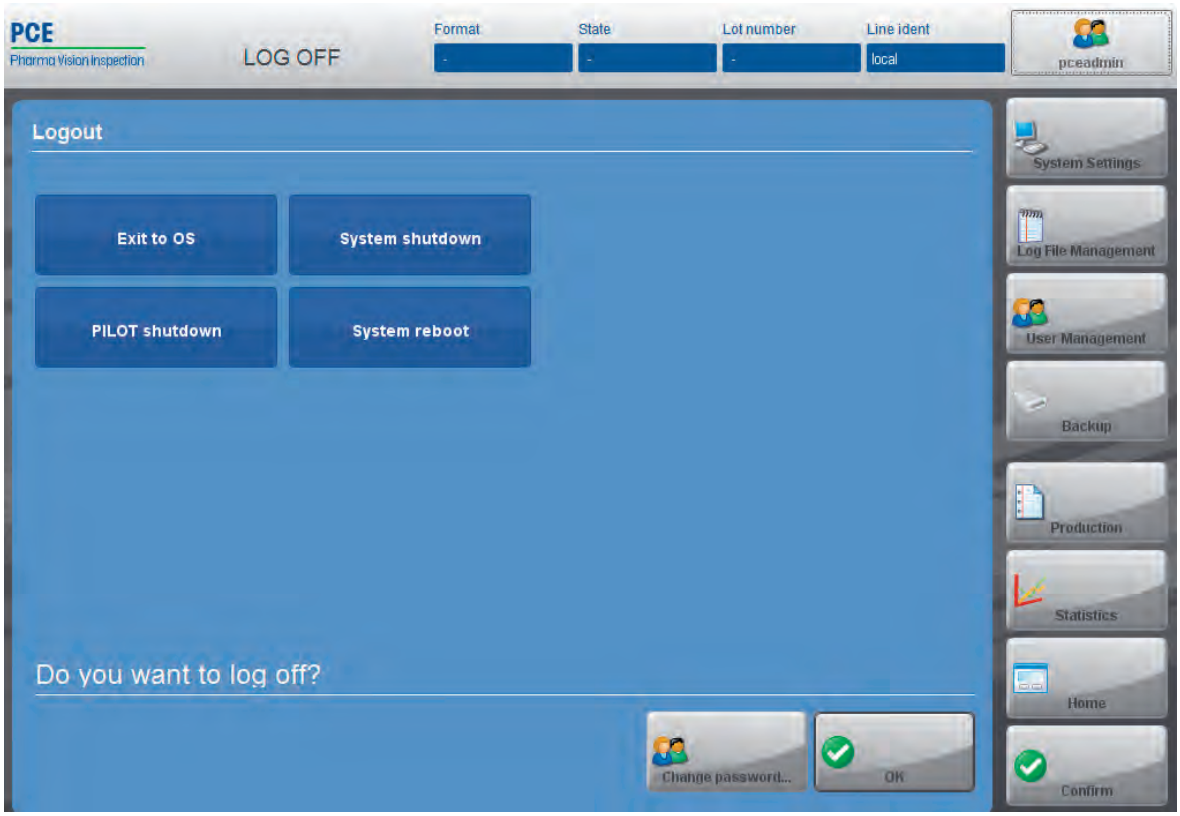


Figure: `admin (active user button)`

The following buttons at the logout screen are only displayed for administrator and engineer users:

- Exit to OS
- System shutdown
- Pilot Line Manager shutdown
- System reboot

The supervisor and operator do not see any additional buttons at the logout screen. Select one of the functions and confirm with `OK` or directly confirm with `OK` to log off.

4.5 Input Function

Easy operation of the PLM by fingertip is possible thanks to the 15 inch touch display. You can operate the keyboard displayed on the screen if inputs need to be made. The keyboard is displayed automatically, if needed, by clicking an input field. The appearance of the keyboard depends on the country settings.

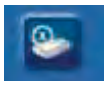
As per hardware keyboard the next field can be accessed by `Tab` and `Shift` changes to capital letters.

Figure: Keyboard1

The respective active input field, where data can be entered will be highlighted yellow. Depending on the position of the input field the keyboard will be displayed either in the upper or lower third of the screen, as such that the corresponding input field will remain visible.

Move the keyboard by dragging moving and dropping it.

With these arrows the keyboard can be positioned on the upper or lower end of the screen.



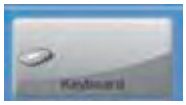
Close the keyboard by pressing this button.

Switch language.

Keyboard size.

By pressing Enter the focused button at the screen will be executed. This button is easily recognized by the black frame (see the Login button at the following example).

Figure: Frame



If using an external keyboard the keyboard displayed on the screen can be switched off for the duration of the registration of the user by pressing the button Keyboard.

Alternative Keyboard Configuration

Optionally a modern keyboard designed analog to the Android smart phone keyboards can be used. The Launcher.bat file has to be called with the parameter –fxkeyboard. This layout is supported from version PLM 4.7.1.

Figure: Keyboard2

Control key functions:

Hide keyboard

Switch to other language keyboard layout

Switch to special character and number layout

Switch to control key layout

Special character and number layout:

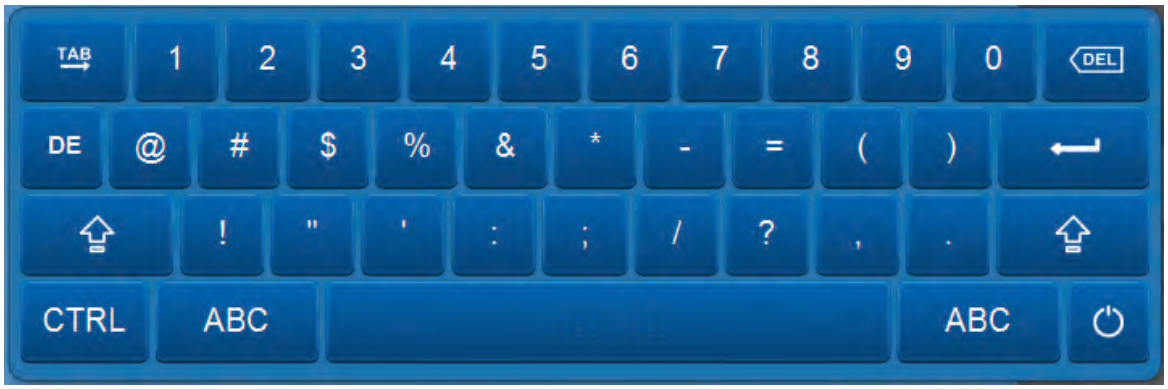
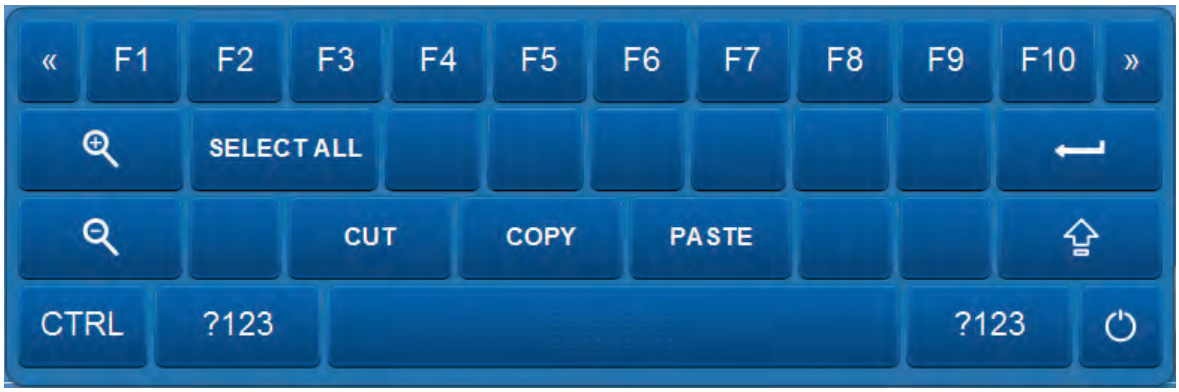


Figure: Control key layout:



4.5.1 Remote Control

If you want to control the PLM software via remote control, use a common remote desktop program e.g. Teamviewer©. In addition you need an internet connection; performance will be dependent on the speed of your internet connection.

4.6 Home Screen

The following figure shows the `Home` screen:

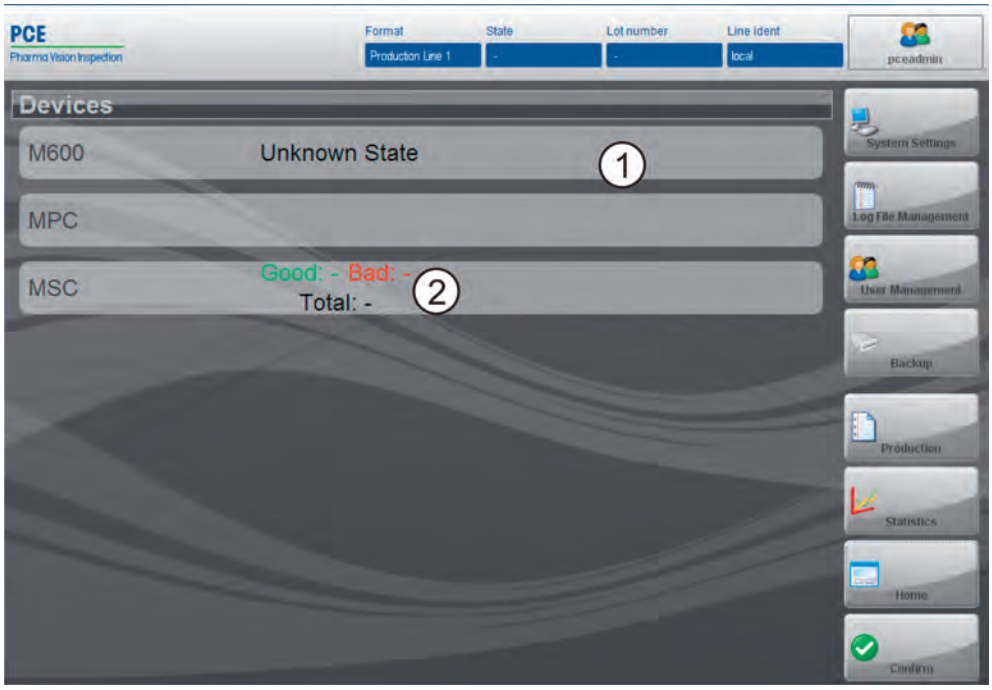


Figure: `Home (while production is running)`

Pos.	Name	Function
1	Device Status Bars	The main menu of the Pilot Line Manager always remains visible. All operating elements available are displayed in order to be able to change between the program functions (depending on the authorization level of the user).
2	Counter	(Good/Bad/Overall) of the devices attached

Help Button

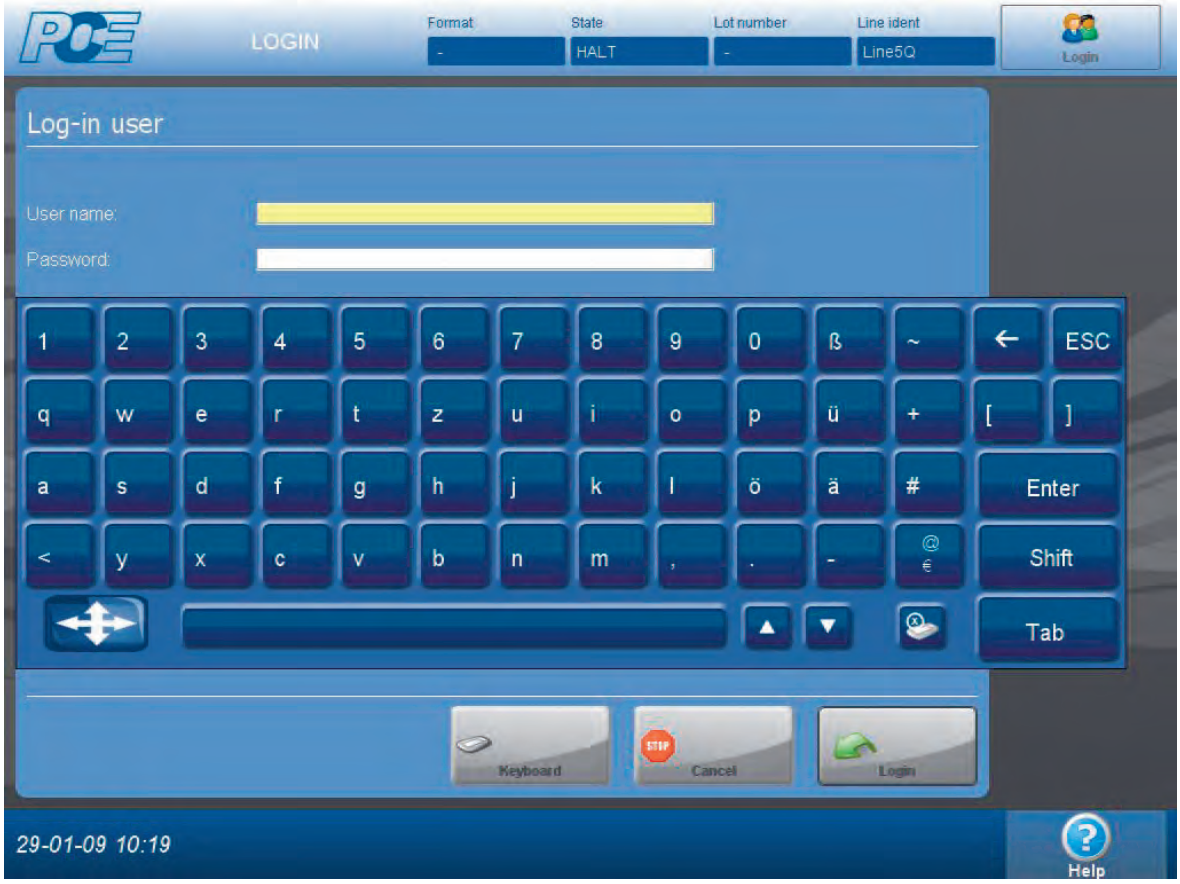


Figure: `Help button at the screen`

The `Help` button contains a digital version of this documentation and is always visible in the lower right corner of the status line.

5 Administration of Users and Groups (A-3.5)

The User Management settings at the PLM are equivalent to the settings at the PSM. Both systems use the same user profiles. At the PLM all user rights are being managed centrally. Name, password and certain rights are assigned to each user access/group respectively. The type of right/group determines access to the possible program functions.

Note

User Management is pre-configured

Upon start-up the user management is pre-configured from PCE service staff!

A user management is included in order to add/edit and delete users and groups. All functions in the software can be restricted due to user rights, assigned to a group or user. Rights can be assigned directly to a user, or along with other rights building a group which can then be assigned to a user.

5.1 User Management (A-3.5.1)

To open the `user management` press `User Management` at the menu panel on the right hand side of the screen. At the overview you can select the user you want to edit or you can create a new user.

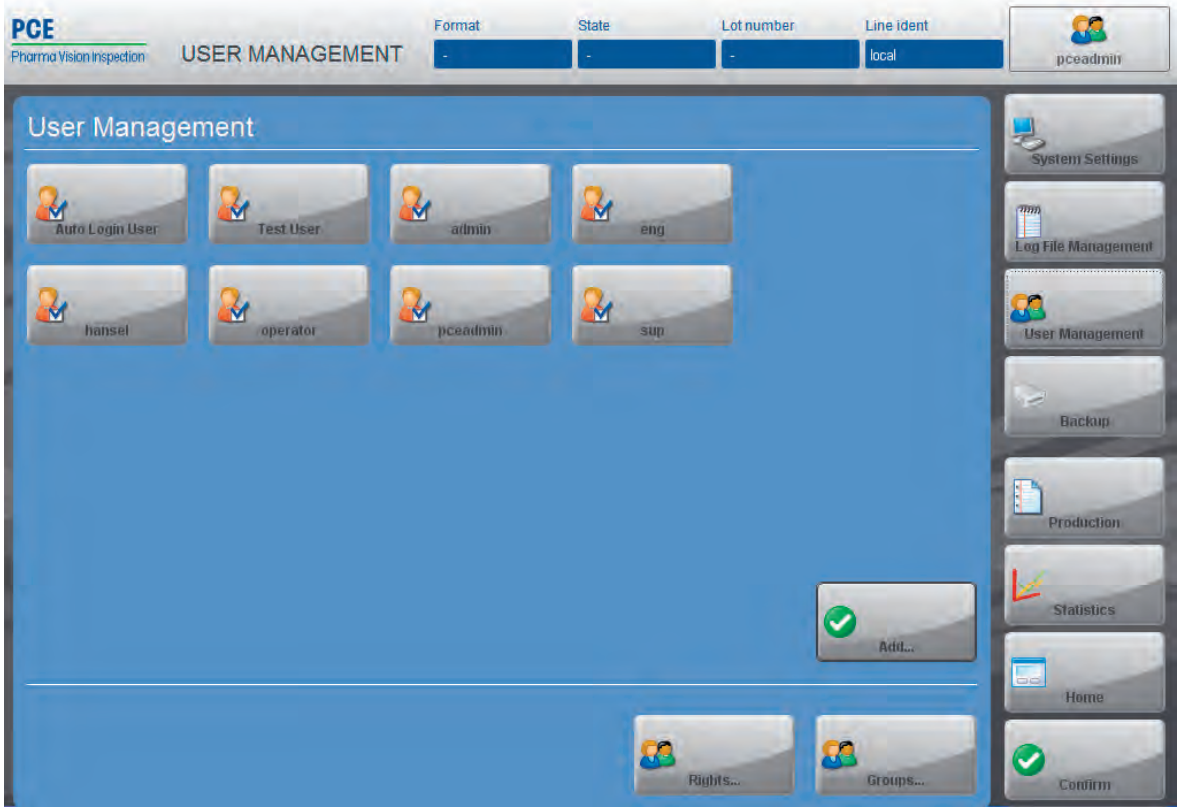


Figure: `User Management`

5.1.1 Creating a New User

To create a new user press `Add`. The following screen appears:

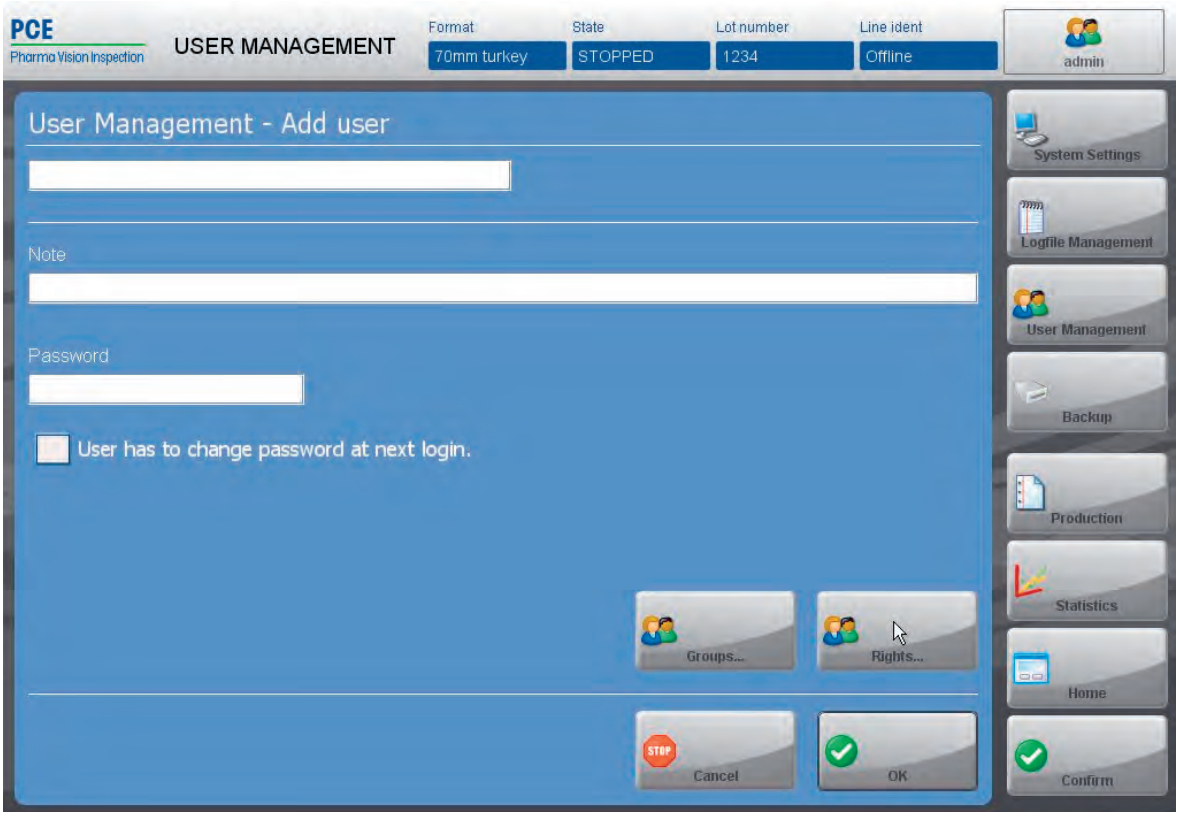


Figure: `User Management > Add`

Enter the new username, a password and confirm with `OK`

Note

Choose a secure password

The password strength corresponds to the security of the password. A secure password contains lower-case and upper-case letters, numbers and also special characters.

5.1.2 Editing a User Account

After you have selected a user to edit, see chapter 5.1 (page 25), the following screen appears:

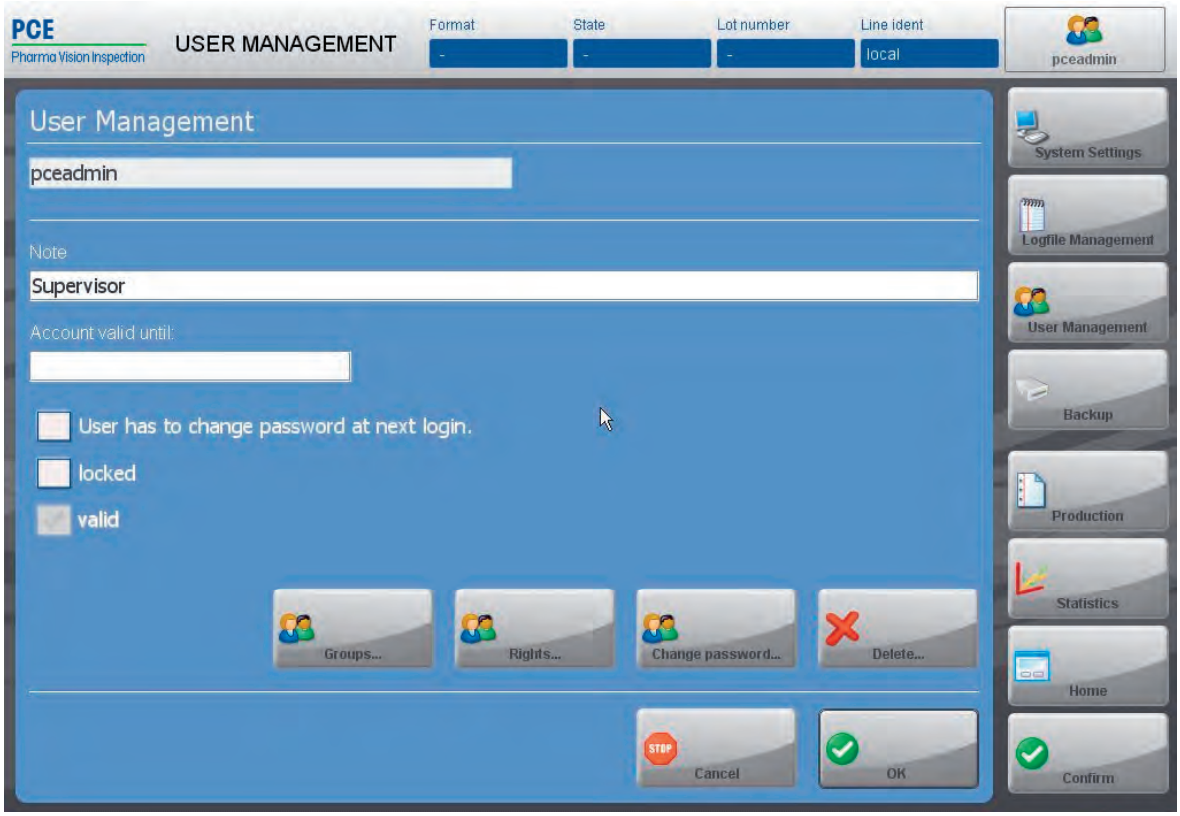


Figure: `User Management > Add > OK`

The following options for the user can be set:

- User account valid until: Here you can set how long the user account will be valid. Enter a date. After this date access is automatically blocked.
- User has to change password at next login: At the next login the user is requested to change the password that was given by the administrator. The password strength corresponds to the security of the password. A secure password contains lower-case and upper-case letters, numbers and also special characters.
- Locked: A user account can be locked and released. If a user no longer needs its account, access can be locked. If a user enters the wrong password several times (number is depending upon system settings), the account is automatically locked. Only users with specific rights can unlock the user account again.

With the buttons at the lower part of the screen you can call up the corresponding functions as described in the following chapters. The table below gives an overview of these functions:

Name	**Function**
Groups...	Add the selected user to the desired group
Rights...	Add the desired rights to the selected user
Change Password...	Change the password of the selected user
Delete...	Delete the selected user

5.1.3 Adding a User to a Group

Select a user (see chapter 5.1 (page 25)) and press `Groups`. The following screen appears:

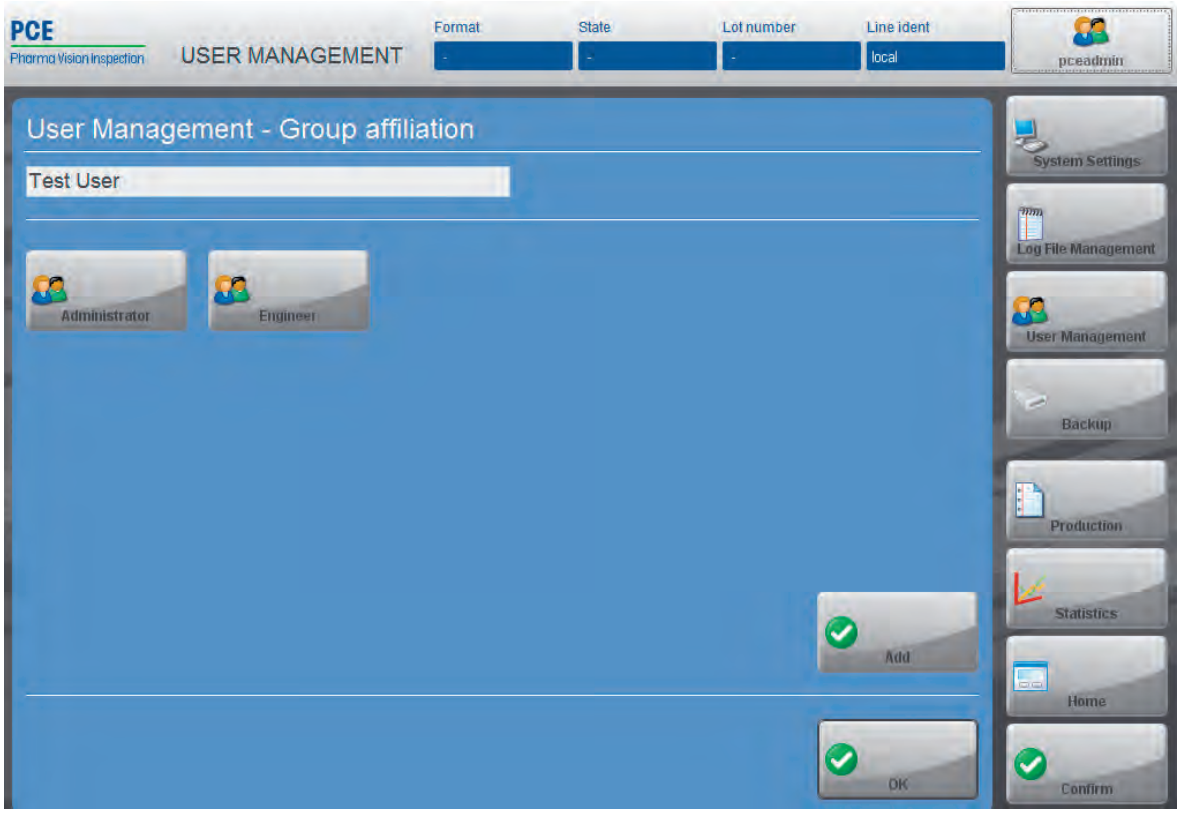


Figure: `User Management > (User) > Groups`

Select the group to which you want to add the user and press `Add`. A screen appears where you can see to which groups the user is already added to. Choose the group where the user has to be added. Repeat this step to add the user to additional groups. If you want to withdraw the user from a group select the group and press `Delete`. Once you have finished editing the affiliation of the user confirm with `OK` to leave the screen.

5.1.4 Adding or Withdrawing Rights to a User

Select a user (see chapter 5.1 (page 25)) and press `Rights`. A screen appears where you can see which rights are already added to the user:

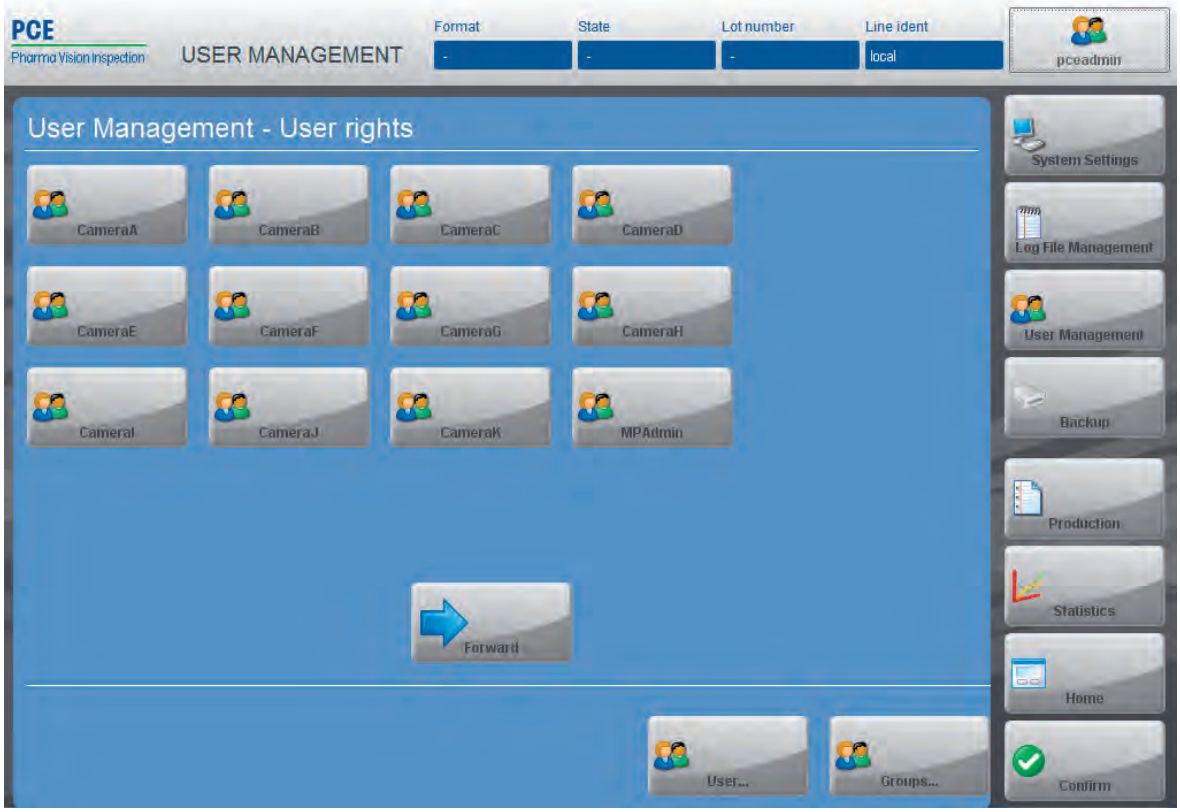


Figure: `User Management > (User) > Rights`

Press `Add` and select the right you want to add to the user and confirm with `OK`. If you want to withdraw user rights select the right you want to withdraw and press `Delete`.

5.1.5 Changing the Password of a User

Select a user (see chapter 5.1 (page 25)) and press `Change Password`. The following screen appears:

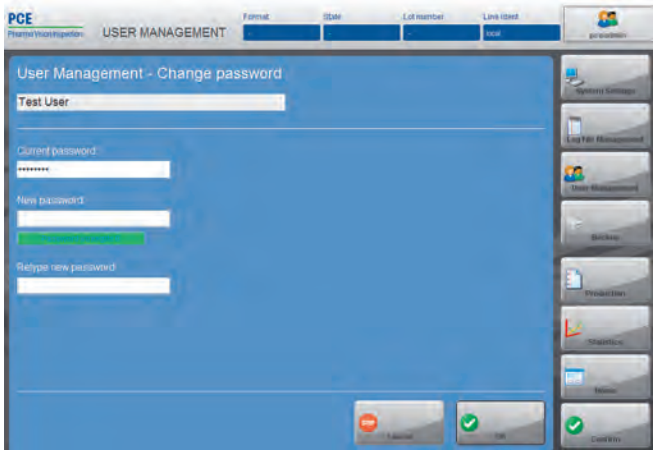


Figure: `User Management >(User) > Change password`

The password strength corresponds to the security of the password. A secure password contains lower-case and upper-case letters, numbers and also special characters.

Enter the new password retype it and confirm with `OK`.

5.1.6 Deleting a User Account

Select a user (see chapter 5.1 (page 25)), press `Delete` and confirm with `OK`.

5.2 Creating and Editing Groups (A-3.5.2)

Within the groups menu you can create new groups. The "Level" setting (1 … 10) enables administrators who do not have the "maySeeAllUsers" right to view and edit all users on lower levels (for user administration purposes).

Press `User Management` at the menu panel on the right hand side of the screen in order to get to `User Management/Groups`. Then press `Groups`. The following screen appears:

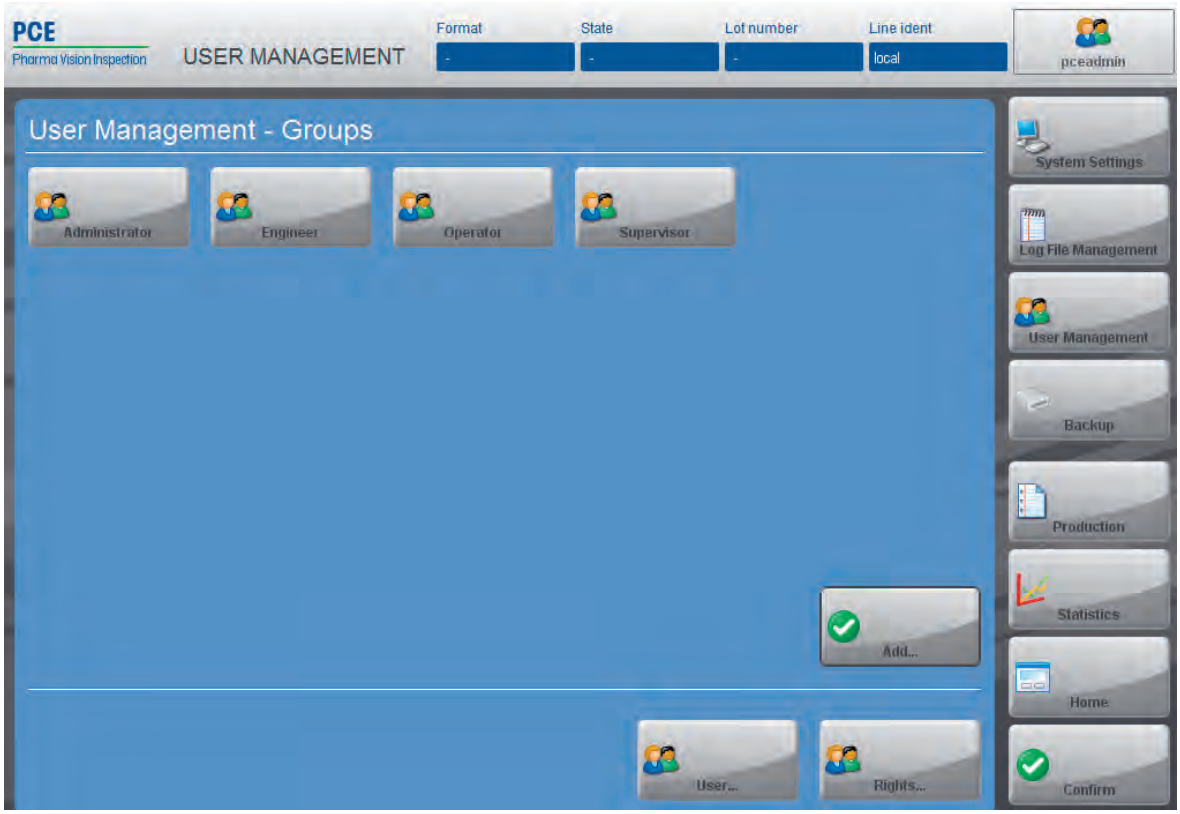


Figure: `Figure: User Management > Groups`

5.2.1 Creating a New Group

Go to `User Management - Groups` (see chapter 5.2 (page 30)) and press `Add`. The following screen appears:

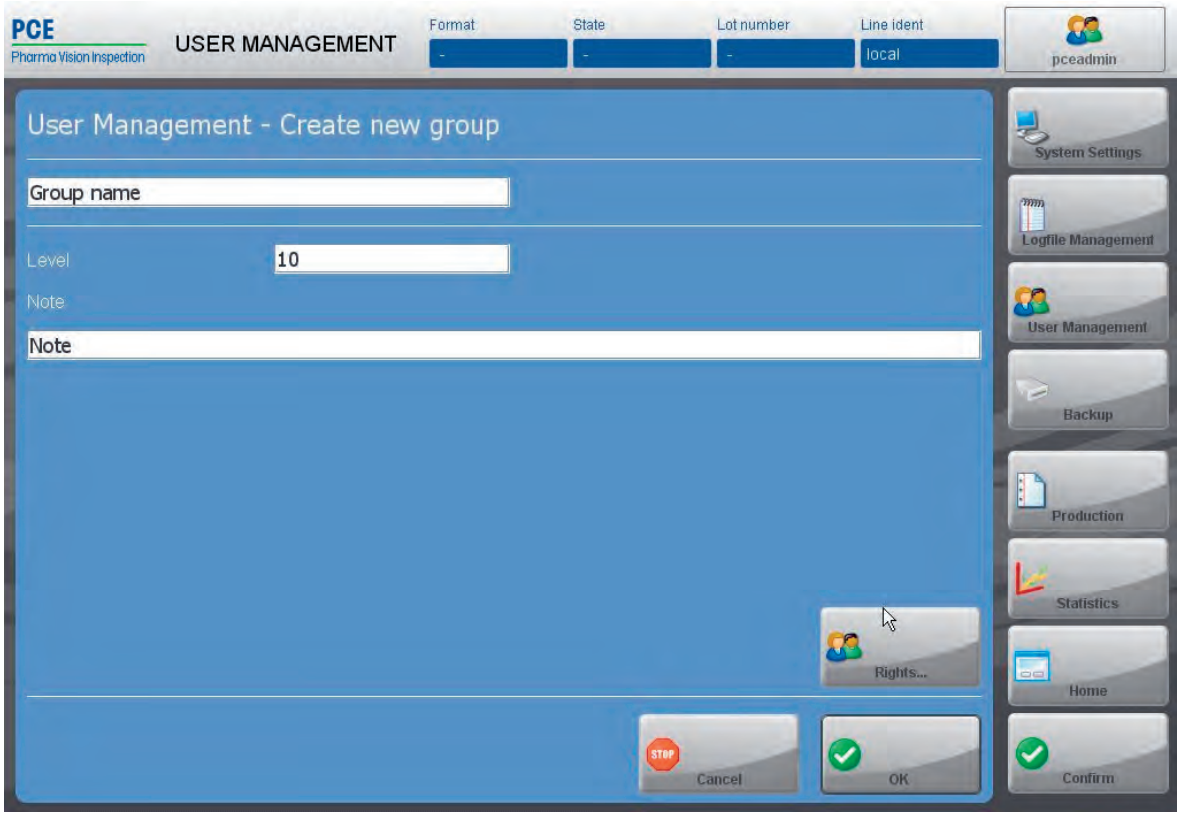


Figure: `User Management > Groups > Add`

Enter the new group name and assign a level to the group. If required add a note. Confirm with `OK`.

5.2.2 Adding or Withdrawing Rights to a Group

Go to `User Management - Groups` (see chapter 5.2 (page 30)), select the group you want to edit and press `Rights`. At the following screen you can see which rights are already added to the group:

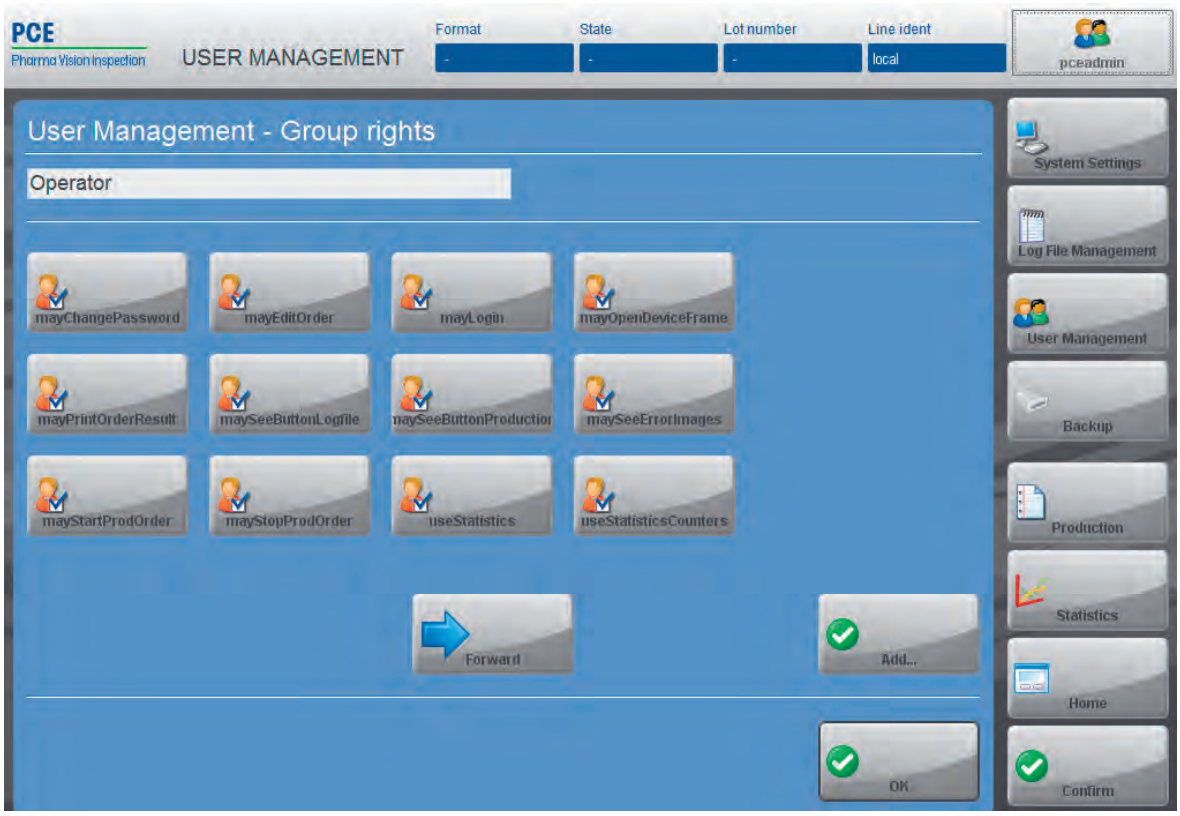


Figure: `User Management > Groups > Rights`

- Add rights: Press Add and select the right you want to add to the group and confirm with `OK`.
- Withdraw rights: Select the right you want to withdraw and press `Delete`.

5.2.3 Deleting a Group Account

Go to `User Management - Groups` (see chapter 5.2 (page 30)), select the group you want to delete and press `Delete`. The group is deleted immediately.

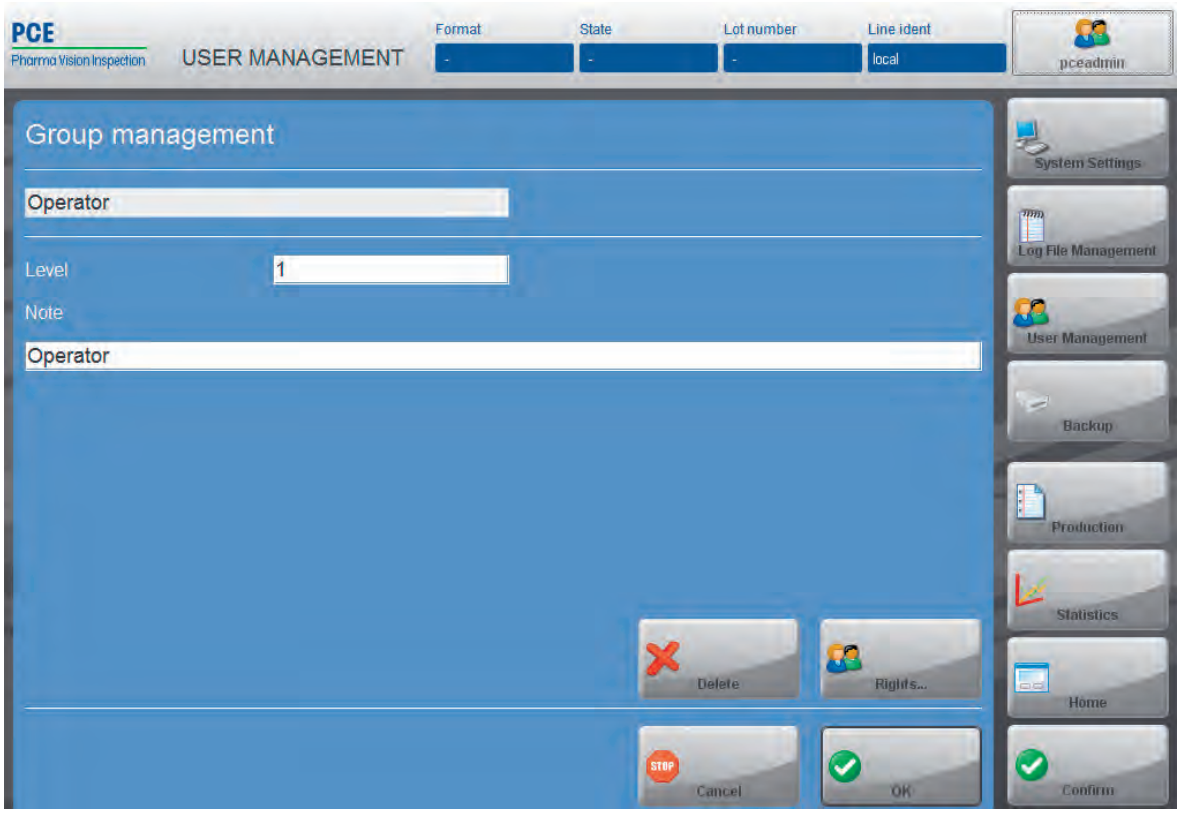


Figure: `User Management > Groups > (select group)`

Note

ADS login

It is possible to connect/login to an **A**ctive **D**irectory **S**erver without creating extra users for the Pilot Line Manager. The login via active directory will return a user level which is mapped to certain groups from the PLM.

5.3 Active Directory (H-1.12)

Notice: These settings can only be executed by experts with respective authorization. Active Directory requires global settings (see PLM manual chapter 9.2.1).

Three basic steps have to be performed to connect the local database with Active Directory:

Step 1 - LDAP environment:

1. Register groups
2. Assign user to created groups

Step 2 - PLM environment:

1. Create identical groups as created in the LDAP environment in the PLM
2. Define rights for the respective groups in PLM

Step 3 – PLM System Settings:

1. Select System Settings
2. Enter IP address (Host name) of the Active Directory Server in AD01

3. Enter domain name of the Active Directory domain in AD02
4. Enter Active Directory search path in AD03
5. Enter Active Directory search filter in AD04

Configuration Example:

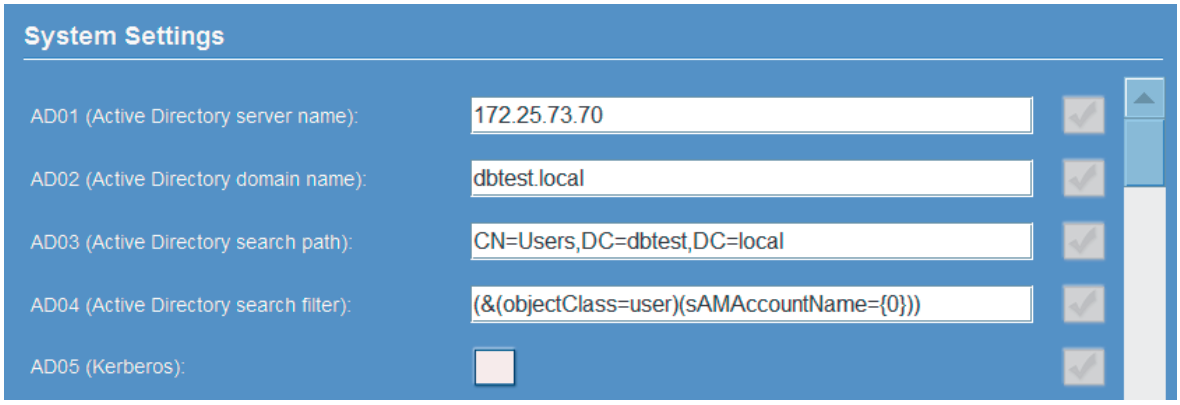


Figure: `System Settings > Edit System Settings`

Time synchronization is only required if there is a Kerberos authentication. This needs to be changed in domain controller.

Login if Active Directory is not accessible

If Active Directory is not accessible, there is a standard user in all of the groups. Use this standard user to login to PLM.

6 Preparation for Production (A-3.6)

6.1 Overview of Production

This is an overview on what has to be done prior producing a product.

Step	Action	Comment	Explanation
0	Create devices	(precondition)	Select Device Class. Set device Name and Settings.
1	Create product	(optionally)	See product management
2	Add a line format	Add a line format	Name the line format. Assign a product if applicable. Information and settings on how a line is built up: which devices are used at the line format
		Edit device settings at line format	AI fields that have to be used are selected. (PLC, camera, printer…)
3	Create an order		Information about and settings of an order including the AI values are entered. A line format is assigned and also a product can be assigned.

6.2 Creating and Editing Devices (A-3.6.2)

Important System settings have to be made, devices have to be created. Possible devices are:

- Printers
- Cameras
- Hand Scanner
- PLC
- UPS
- Com Interfaces
- Servers
- Comparator VGL7/VGL8
- Checkweigher

6.2.1 The System Settings Overview Screen

In this menu users with administrator rights can change important system parameters.

Note

System settings should only be changed by trained personal

The PCE tool setter pre-configures system settings at start-up! Changes of these settings can lead to a shutdown of the device!

To open the `system settings` overview press `System Settings` at the menu panel on the right hand side of the screen. The following screen appears:

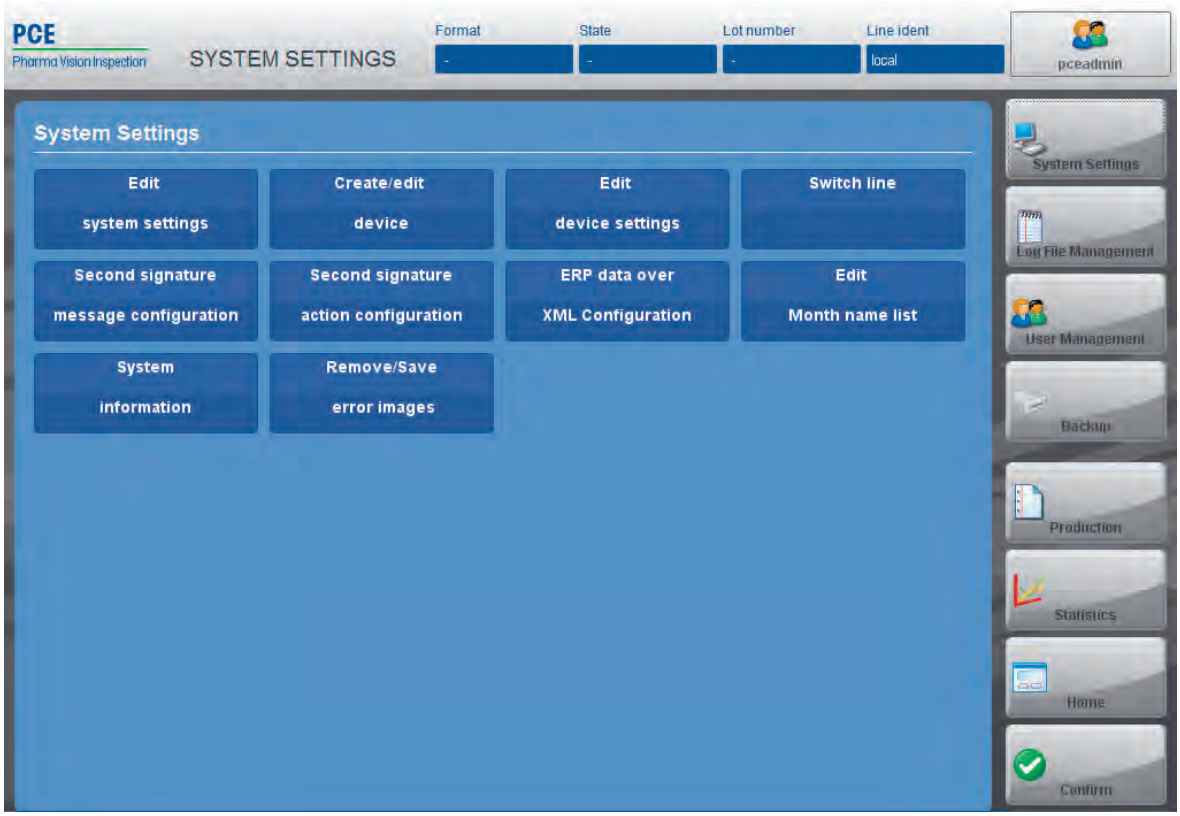


Figure: System Settings

At the appearing screen the available buttons lead to the functions as follows:

Name	Function
Edit system settings	List where you can edit, enable or disable system-wide parameters
Create/edit device	Create or edit devices for usage in line
Edit device settings	Edit settings of the devices
Switch line	Select another line for production
Second signature message configuration	Define messages which need to be confirmed by second signature
Second signature action configuration	Define actions which need to be confirmed by second signature
ERP data over XML Configuration	Define paths, where the PLM gets order and product data of an XML document
Edit Month name list	Define input and output format for the name of the month
System information	Here you get information about the system like database and installed devices
Remove/Save error images	Remove or save error images

6.2.2 Editing System Settings

At this screen you can edit parameters which are valid for the whole system. Press Edit system settings at the system settings overview (see chapter 6.2.1 (page 34)). The following screen appears:

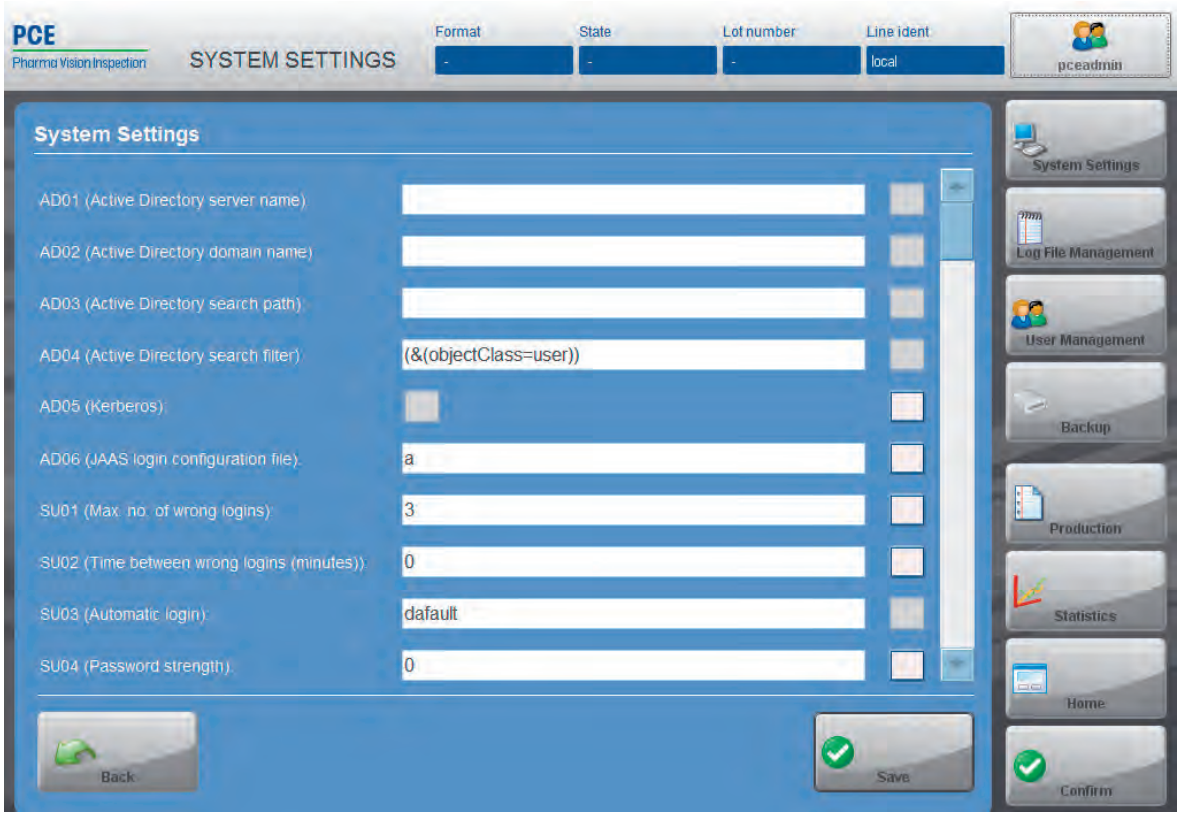


Figure: `System Settings > Edit System Settings`

To enable a parameter set a checkmark in the corresponding checkbox and set a value if applicable. Grayed out checkboxes are global system settings, how to change them see chapter 9.2.1 (page 163). To apply changes at the system settings, the PLM has to be restarted. The table below lists all parameters that can be set here:

6.2.3 Table: System Parameters

ID	Parameter	Description	Default	Allowed values
AD01	Active Directory Server name	Name of the server with the Active Directory	-	Alphanumeric
AD02	Active Directory Domain name	Domain name of the server with the Active Directory	-	Alphanumeric
AD03	Active Directory search path	Search path in which the server is found with the Active Directory.	-	Valid Path
AD04	Active Directory search filter	Type of user admin	(&(objectClass= user))	Alphanumeric
AD05	Kerberos	Use Kerberos authentication	☐	Checkbox
AD06	JAAS login configuration file	Configuration for Active Directory	-	Valid Path
SU01	Max. no. of wrong logins	Maximal number of wrong logins which locks further logins.	3	Numeric
SU02	Time between wrong logins	Time after a wrong login, after the count of maximal wrong logins is reset.	0	Numeric
SU03	Automatic login	A user who is used if nobody is logged in.	-	Username
SU04	Password strength	Calculated value for safety of password. "0" if password doesn't match with rules.	0	0 … 255

SU05	Password-validity (month)	Number of month after a password must be changes.	12	Numeric
SU06	Password history	Number of passwords until an old password can be used again.	5	Numeric
SU07	Automatic logout (minutes)	Number of minutes with no action after the user is logged out.	30	Numeric
SU08	Keyboard always ON	Activation / de-activation of the touch screen when Pilot Line Manager is operated using the external keyboard. Yes = Work with touch screen No = Work with mouse and keyboard	☑	Checkbox
SE01	Company Prefix	Used for SSCC values (Aggregation)	-	Numeric
SE02-SE-04	Rank 2 SSCC Extension Code … Rank 4 SSCC Extension Code	Prefix for SSCC_Values, that the rank defines	0/1/2	0 … 9
SR00 - SR08	Rank 0 Description … Rank 8Description	Description of the Ranks (hierarchical level)	Global/Unit/Bundle/Case/Pallet	Alphanumeric
FP01 – FP08	SN Fix Part Rank 1 … SN Fix Rank 8	Fixed part of the serial number for the relevant rank	-	Alphanumeric
SL01 - SL08	SN var. length Rank 1 … SN var. length Rank 8	Length of the variable portion of the serial number	12	Numeric
SX01	SN Extra percentage	Reserve volume of additional (not used) serial numbers in percent	0	Numeric
SA01 – SA08	SN Algo Rank 1 … SN Algo Rank 8	Algorithm for generating serial numbers: INC: incremental generation of serial numbers INCRND<Number>: Chance numbers between zero and <Number>	INC	INC<Number> / INCRND<Number>
ES01	ERP SN Ranges	Takes over/does not take over the serial number from ERP	☐	Checkbox
PA01	PDF templates path	Directory for filing the PDF report templates. This can be done centrally for several lines. If the field is empty, the standard folder of the PCETnT directory will be used.	-	Valid UNC path.
PA02	PDF path	Directory for filing the PDF reports of the line. This can be done centrally. If the field is empty, the standard folder of the PCETnT directory will be used.	-	Valid UNC path.
PA03	Print screen path	Path for screenshots of the PLM. Enter the directory path, e.g. D:\pictures. Triggering is done via external keyboard by pressing the print key.	☐	Checkbox

SI01	Second signature	Switches on whether Second Signature is active or not.	☐	Checkbox
SI02	Second signature group	When activated, only users who join the "SI02 Second Signature" group are allowed to confirm signatures.	☐	Checkbox
SV01	Supervisor station	Switches the software to the supervisor mode.	☐	Checkbox
EI01	Max error images count	Max. number of error images left in memory.	10	Numeric
EX01	ERP over XML	When activated data are imported from PSM.	☐	
XP01	ERP over XML path	Path of XML documents in a data transfer	-	Valid Path
IP01	Default IP	IP address, which defines by several network cards in the address area of the devices	-	IP address
EM01	ERP XVIEW Mode	Imports/does not import the orders from ERP	☐	Checkbox
DP01	Parallel devices start up:	Activates/deactivates the parallel loading of the order data to the devices (accelerated production start).	☐	Checkbox
EF01	Allow Empty fields in order tables	Only for "French Coding". Empty fields are not printed and not checked.	☐	Checkbox
RF01	Reset readers ref. code	After finishing production, invalid reference codes are sent to all reading devices to prevent reading of codes after production is finished.	☐	Checkbox
WT01	Startup waiting time (sec)	If a database connection is missing, a start delay can be set.	0	Numeric
US01	PLC not UPS supplied	If there is a power failure during production, an attempt to read the last counter by the PLC will fail. This will avoid blocking the Pilot Line Manager application.	☐	Checkbox
PS01	Parallel devices connection	Activates/deactivates the parallel start of the devices when starting up.	☐	Checkbox
FR07	Filter Open Order	Customized ERP order import	☐	Checkbox
DR01	Dynamic Device Ranks	The device rank is variable and is defined in the line format.	☐	Checkbox
KA01	Keep Agg. Rank State	In case of production interruptions, the input product ranks will not be deleted, they will be saved.	-	2…8, separated by comma (e.g. 2,3,5)
FR01	Set finished order read-only	At the end of order the status will be set to "4" instead of "3" (usually it is set to "3"). Thus, it will not be possible to commission and decommission manually.	☐	Checkbox

LC01	Local Cache Mode	Activates/deactivates buffering of the order data in order to be able to continue production without database connection.	☐	Checkbox
EA01	Allow empty aggregation	Allows aggregation of empty cases to pallet although a content count is defined.	☐	Checkbox
RA01	Reprint new serial	When reprinting a damaged label, the new label gets a new serial number instead of reusing the old serial number.	☐	Checkbox

6.2.3.1 Taking Screenshots

To trigger a screenshot of the current screen, press the <print key> button at the external keyboard. Precondition:

- Set a checkmark in the checkbox at the parameter PA03 in the system settings and enter the directory path there and press `Save` to save the settings.
- Restart the PLM to apply the settings.

6.2.3.2 Local Cache Mode

Usually the PLM is connected to a central database and all data are written to database continuously. If database connection is lost; PLM is not able to continue the production. The local cache mode allows continuing the production also if database connection is lost, by storing the order data to the local cache. To enable local caching:

- Set a checkmark in the checkbox at the parameter LC01 in the system settings.
- Restart the PLM to apply the settings.

6.2.4 Creating a Device

Before a device can be used in the system it has to be "created" in the PLM. This chapter describes how to create and edit devices. To create a device open the `System Settings` screen (see chapter 6.2.1 (page 34)) and press `Create/edit device.` At the `Device table for line` screen you see which devices are already created in the PLM:

Figure: `System Settings > Create edit device/add device`

Sequence of Devices (Sort)

At the column 'Sort' you can assign numbers to the devices. The sequence entered here will be adopted for the device bars at the `home` screen and for the tabs at the `Edit device settings` screen.

At this screen you have the following options:

Remove: Inactivates the chosen device, use this for example if a device is not used in any format.

Reconnect: Reconnection if a device is lost. Is only for PCE service staff and should otherwise not be used.

Press `Add` to create additional devices. The following dialog appears:

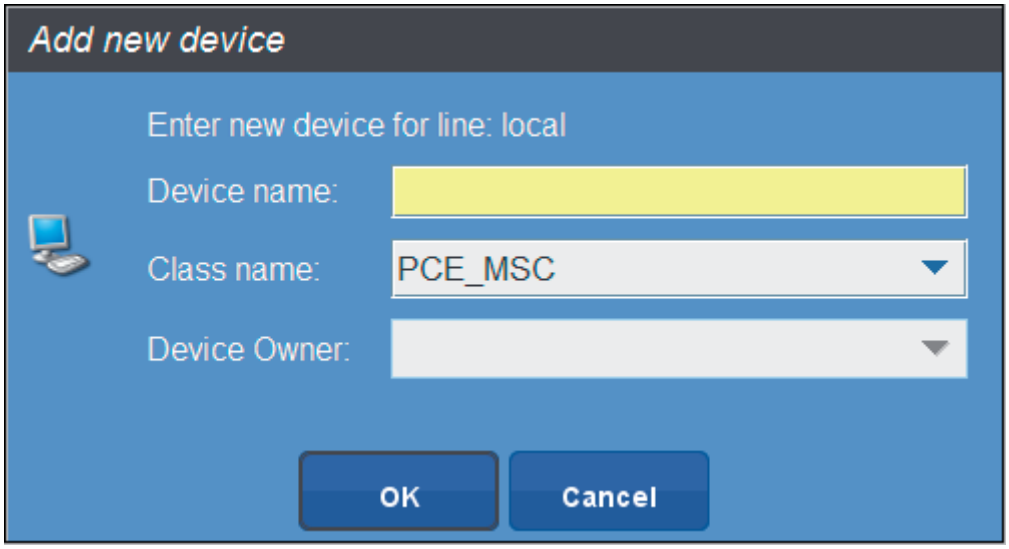


Figure: `System Settings > Create edit device/add device > Add Device`

- 'Device name': Enter an individual name for the device. This will be the name for the device tab at the line format. For clarity we recommend to name the devices as follows: (Station on which the device is used)_(Device). Examples:

- DMS_Wolke printer

- ABS_**HRC**

- 'Class name': The class contains predefined device formats. At the device formats the fields to be printed on a product are defined. At the line format the device formats and their fields are loaded.

'Device Owner' (Virtual Device Owner): Device owner refers to a single master device that exists physically but is to fulfill several functions on various ranks (See example below). If a device does not support the virtualization mode, the device owner field is disabled.

Example for Device Owner:

A printer needs to be able to print different labels on 2 different ranks. It is first registered as a normal "Printer-Master" device. This is the owner or master. This printer is then registered a second time as a virtual "Printer-Slave" device with the owner device: "PrinterMaster". The second printer is then assigned to another rank. Thus there are now two devices in the Pilot Line Manager that can print out labels on a master device.

Note

Press reconnect after Login/log-off

After login/log-off from devices, the button `Reconnect` on the tab "System" must be pressed.

6.2.5 Deleting a Device

To delete a device select it at the `Device table for line` screen (see: Chapter 6.2.3.1 (page 36)) and press `Remove`.

If a device is still linked to a line it is not possible to delete it. The following error message appears: "Device is linked to a configuration". Confirm the message by pressing `Confirm` and deactivate the device at the line or delete the line format.

6.2.6 PLC

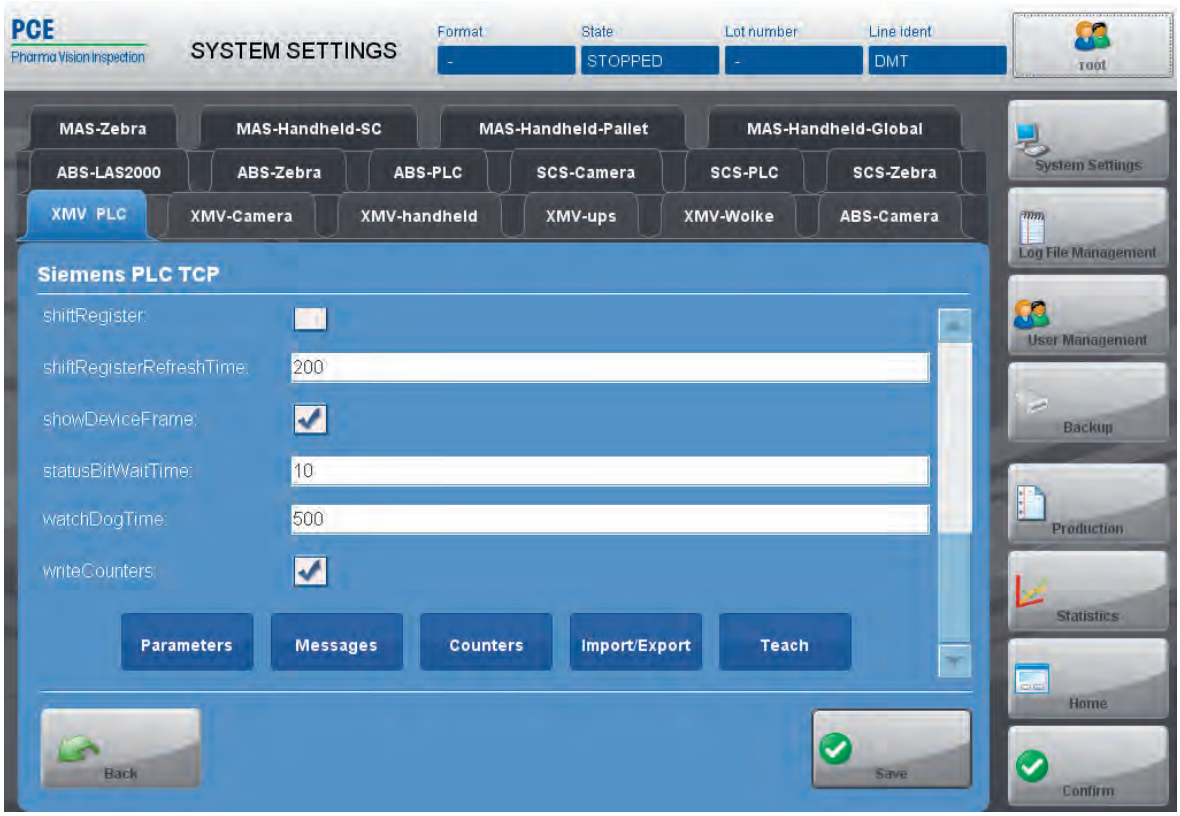


Figure: `System Settings > Edit device settings > (Select PLC tab)`

At the PLC tab scroll down.

With the buttons at the lower part of the screen you can call up the corresponding functions as described in the following chapters. The table below gives an overview of these functions:

Name	**Function**
Parameter	Set, delete and edit PLC parameters
Messages	Set, delete and edit PLC messages
Counter	Configure PLC counter
Import / Export	Import and export of parameters, messages and counters
Teach	PLC configuration (e.g. inform of the positions of the devices and the sensors)

The table below gives an overview of the possible PLC settings of the screen above:

Parameter	**Description**	**Default value**	**Allowed values**
Name	Freely selectable name	-	Alphanumeric
Description	Optional description	-	Alphanumeric
PLCType	Type of the used PLC	S7_200_compatible	Drop-down list
automaticMode	When automatic mode is active, manual operation of the device is not possible.	☑	Checkbox
boxingRank	Hierarchy level	(1) Unit	0 ... 8
counterRefreshTime	Refresh time [ms] for the Pilot Line Manager to ask for new counter values from the PLC	1000	Numeric
heartBeatPLCTime	Time [ms] for the PLC to check the connection to the IPC	1000	Numeric
heartBeatPilotTime	Time [ms] for the Pilot to check the connection to the PLC	1000	Numeric
internalFormats	PLC to administer internal formats	☐	Checkbox
ip	IP address of the device	-	Valid IP address
needDeviceFormat	Device appears on the line format. Printed status	☑	Checkbox
readTimeOut	Waiting [ms] time for an answer before timeout	1000	Numeric
shiftRegister	Display of the shift register in the overview	☐	Checkbox
shiftRegisterRefreshTime	Update time [ms] of the shift register display	200	Numeric
statusBitWaitTime	Time [s], end of production after a timeout of the PLC.	10	Numeric
watchDogTime	Time [ms] to ask for errors	500	Numeric
writeCounters	PLC counter readings are stored in the database in case of discontinuation or stop of the production.	☐	Checkbox
ShowDeviceFrame	Activates/deactivates display of the device in the menu "overview".	☑	Checkbox

6.2.6.1 Import / Export (XML settings file)

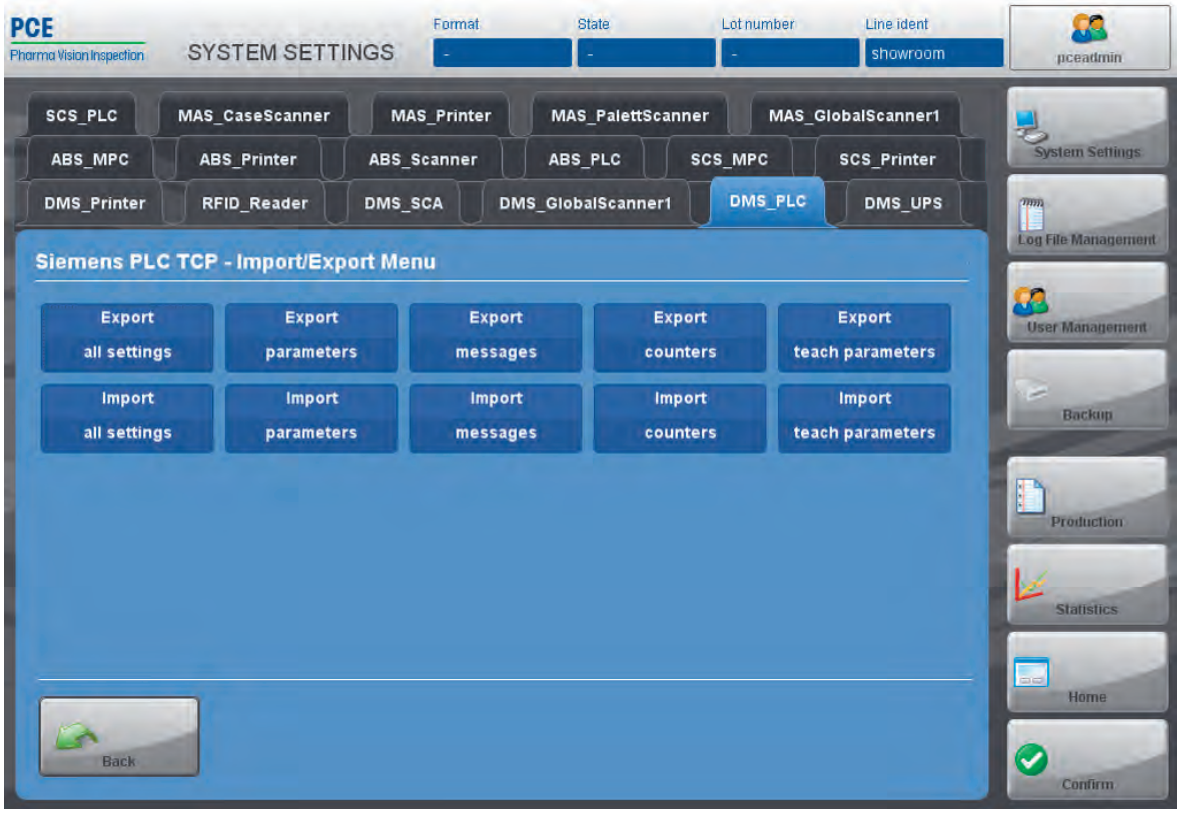


Figure: `System Settings > Edit device settings > (select PLC) > Import/Export`

Press `Import all settings`. The screen looks as follows:

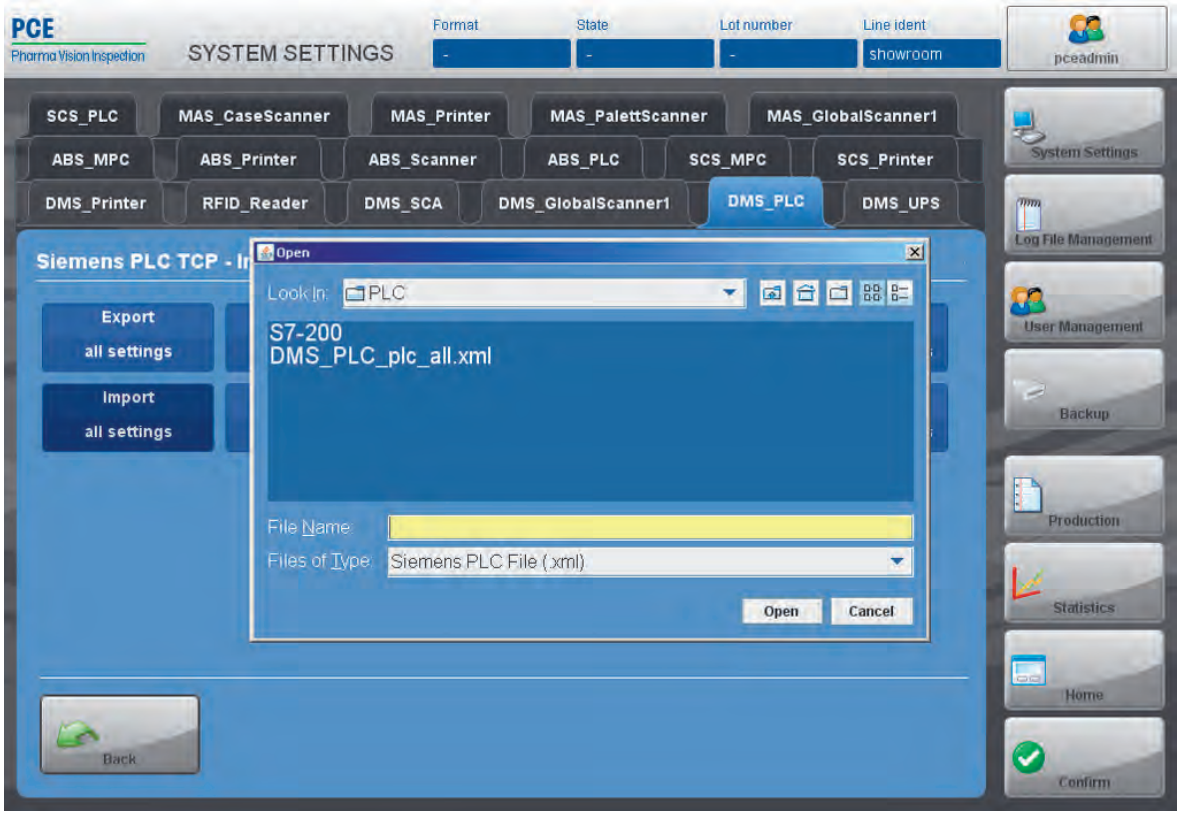


Figure: `System Settings > Edit device settings > (select PLC) > Import/Export > (select file)`

Select the XML file suitable for the PLC version and press `Open`.

6.2.6.2 Parameters

At the following screen you can edit the PLC parameters.

Setting parameter globally

If you want to set a parameter globally for all line formats (settings are not editable at the line format) set a checkmark at its checkbox. Then the values have to be entered here at the system settings.

Setting parameter locally

If you want to change the parameters locally at the line format (settings have to be set at the line format) set no checkmark at its checkbox. Then the values have to be entered at each line format.

Setting a checkmark makes parameter global. Setting no checkmark makes the setting local.

- Global ☑
- Local at device ☐

The screen looks as follows:

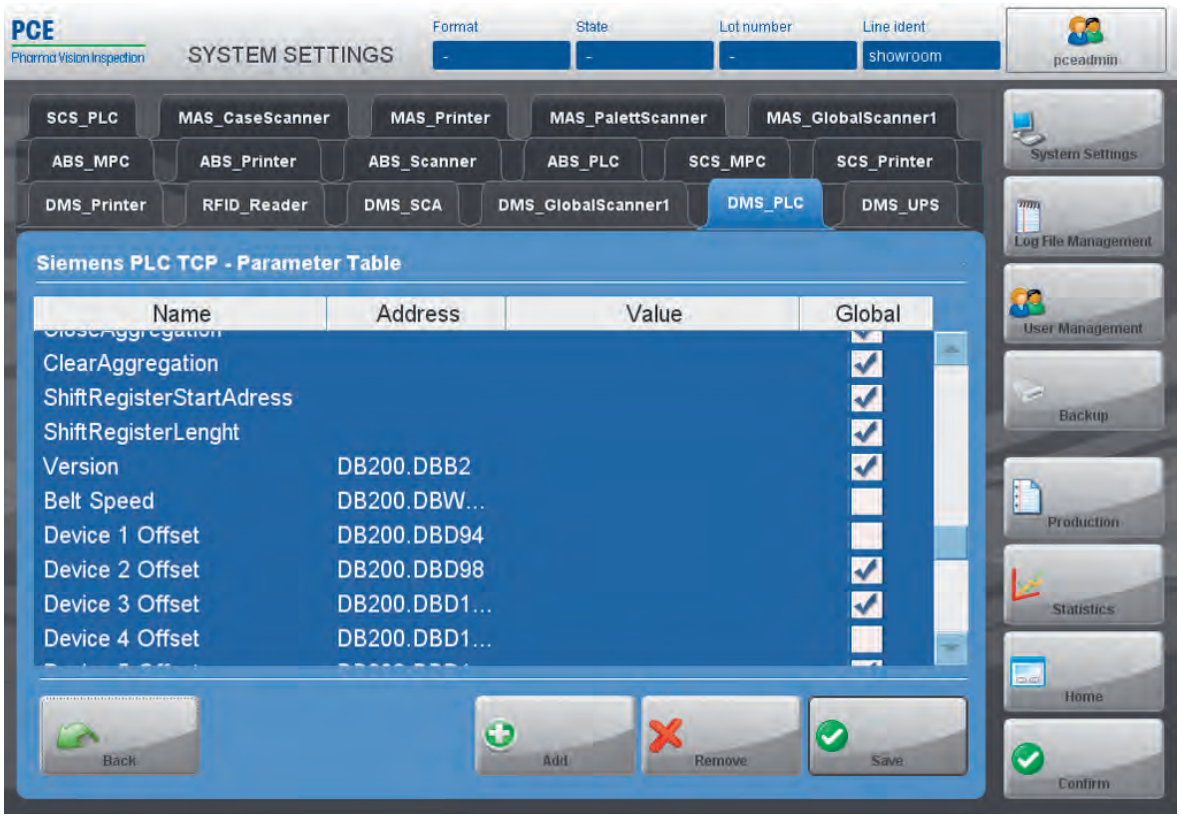


Figure: `System Settings > Edit device settings > (select PLC) > Parameter`

6.2.6.3 Teach

Press `Teach` in order to load the XML data to the PLC. Press `Save` to save the PLC settings.

6.2.6.4 PLC Siemens

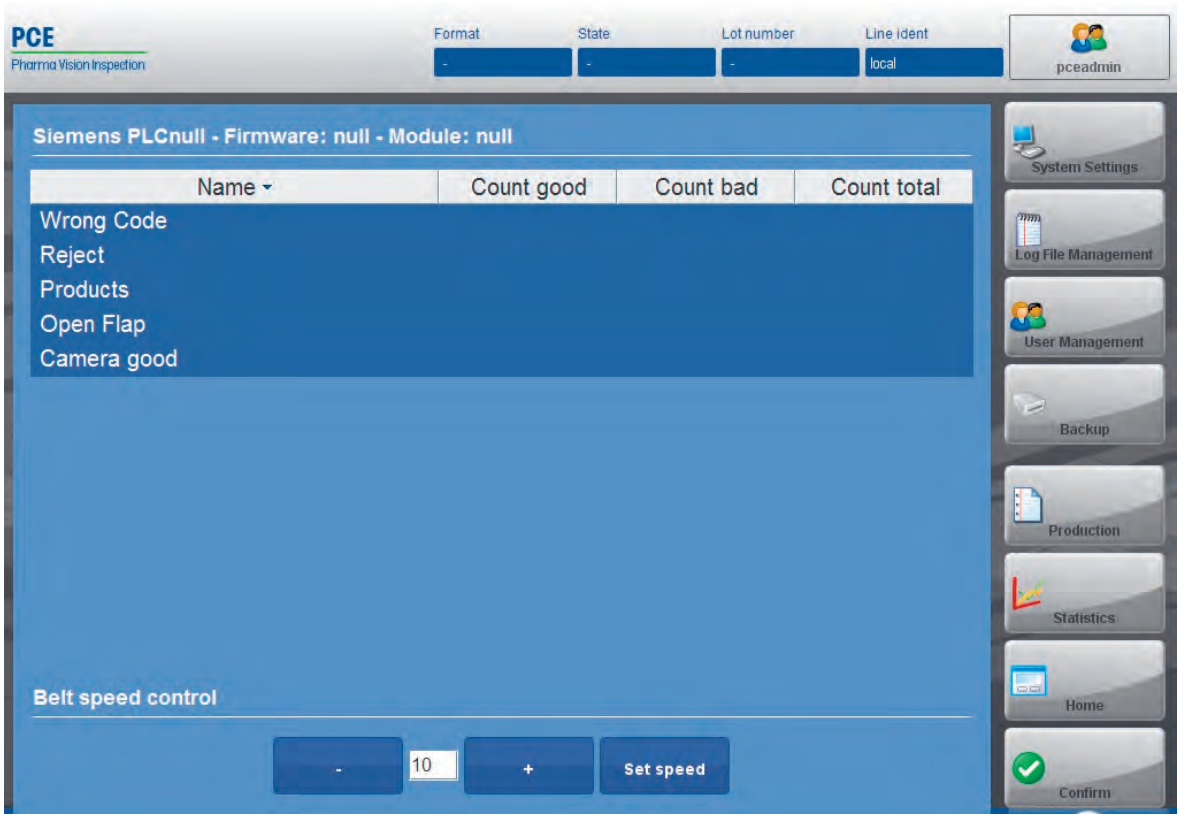


Figure: `Home > PLC`

Class name: Siemens SPS IP / SPS PPI

Only the counters are displayed

6.2.6.5 PLC Allen-Bradley

Class name: Rockwell PLC

Selecting the PLC Allen-Bradley field, the screen below appears with its two buttons `Show PLC IO` and `Select PLC Mode`.

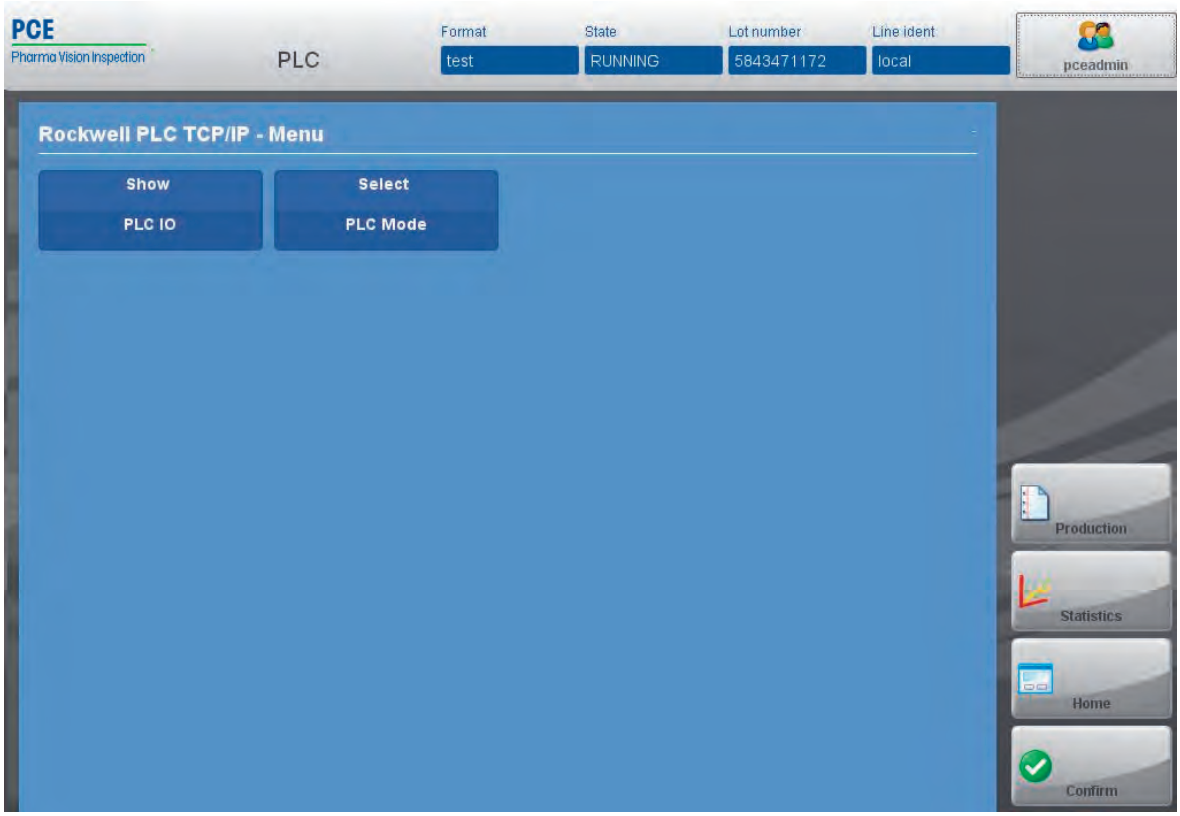


Figure: `Home > PLC`

Select `Show PLC IO` to see which inputs and outputs of the PLC are set. The screen below will appear. This screen is only a display. No manually configuration is possible.

Figure: Home > PLC > IO Panel

Select `PLC Mode` to control functions manually.

Example: Select `Stopper1` to activate Stopper1.

6.2.7 Printers

In this chapter the settings of the printers are described.

6.2.7.1 Printer Mode

The 'printerMode' configures printers and distinguishes aggregation from serialization/static printers.

- 'AGGREGATE_PRINTER': These are only used on ranks > 1 and are supplied with labels individually.
  Example: ABS Bundle Label Printer.
- 'BUFFERED_PRINTER': This is the standard setting for serialization or static printers on rank 1. On this setting, the printer (if online) loads the internal buffer with labels at beginning of production.
  Example: DMS Wolke Printer
- 'LINEFORMAT': This changes the setting of the device settings to line format, in which 'Aggregate Printer' and 'Buffered Printer' can then be selected.

6.2.7.2 Wolke Printer

The Wolke Printer is editable under `System Settings > Edit device settings > (select <wolke printer tab>)`. At the tab menu on the top you can switch between the screens.

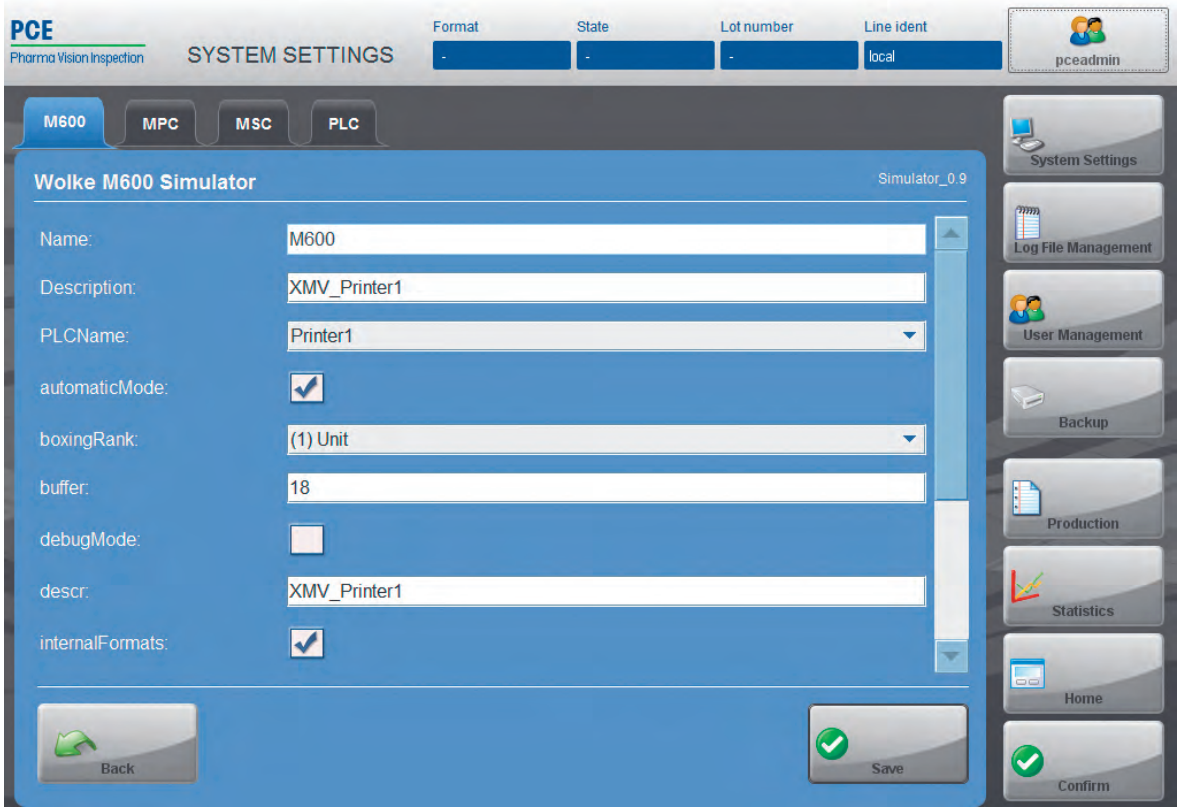


Figure: `System Settings > Edit device settings > (select <Wolke printer tab>)`

Edit the settings at the input fields and scroll down menus. The table below gives an overview of these functions:

Parameter	Description	Default value	Allowed values
Name	Name that has been assigned in the device management settings.	-	Alphanumeric
Description	Optional description	-	Alphanumeric
PLCName	Name of the printer for the PLC (Printer 1 … Printer 8)	-	Drop-down list
automaticMode	When automatic mode is active, manual operation of the device is not possible.	☑	Checkbox
boxingRank	Hierarchy level	(1) Unit	0 … 3
buffer	Number of buffered printers	18	Numeric

debugMode	Output of errors/warnings/messages. Only for PCE purposes	☐	Checkbox
internalFormats	Printer manages internal formats	☑	Checkbox
ip	IP address of the device	-	Valid IP address
needDeviceFormat	Determines whether the device is jointly used in the line format.	☑	Checkbox
port	Port number		Numeric
printerMode	AGGREGATE_PRINTER: BUFFERED_PRINTER:	BUFFERED_PRINTER	Drop-down list
showDeviceFrame	Activates/deactivates the display of the device in the menu "overview".	☑	Checkbox

6.2.7.3 APS/Domino Printer

The APS/Domino Printer is editable under `System Settings > Edit device settings > (select <APS/Domino printer tab>)`. At the tab menu on the top you can switch between the screens. The following two figures display the printer settings of the Domino Printer (initial screen and scrolled down). The settings can be configured.

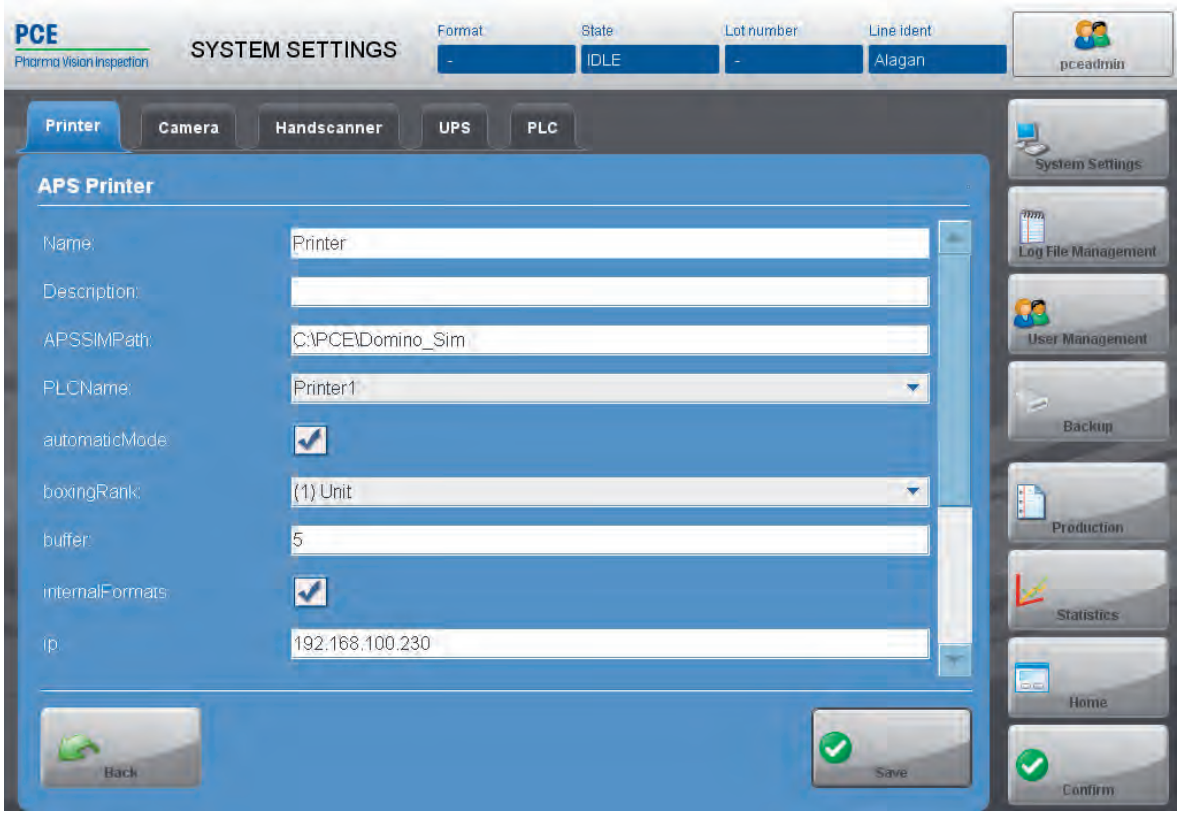


Figure: `System Settings > Edit device settings > (select <APS/Domino printer tab>)`

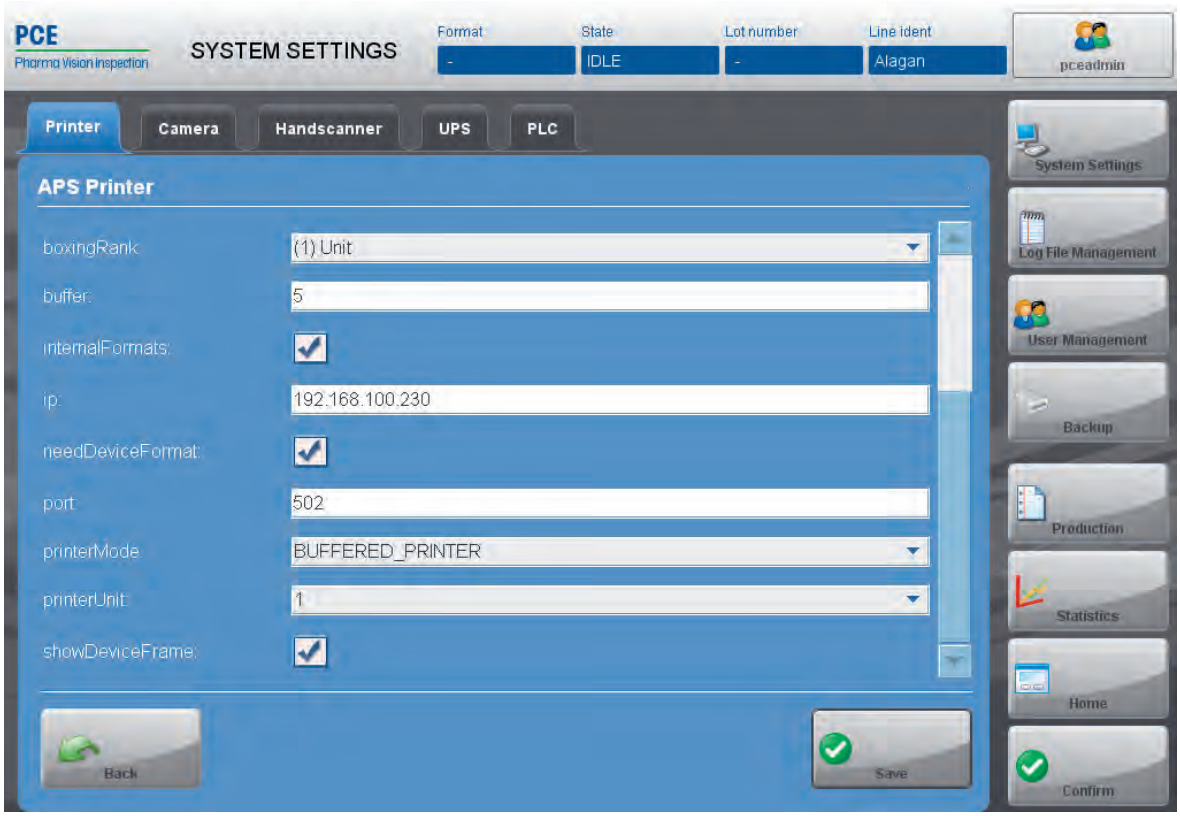


Figure:`System Settings > Edit device settings > (select <APS/Domino printer tab>)`

Edit the settings at the input fields and scroll down menus. The table below gives an overview of these functions:

Parameter	Description	Default value	Allowed values
Name	Name that has been assigned in the device management settings.	-	Alphanumeric
Description	Optional description	-	Alphanumeric
APSSIMPath	Path where the APS simulation software can be found	-	Valid Path
PLCName	Name of the printer for the PLC	-	Drop-down list
automaticMode	When automatic mode is active, manual operation of the device is not possible.	☑	Checkbox
boxingRank	Hierarchy level	(1) Unit	0 ... 3
buffer	Number of buffered printers	5	Numeric
internalFormats	Printer manages internal formats	☑	Checkbox
IP	IP address of the device	-	Valid IP address
needDeviceFormat	Determines whether the device is jointly used in the line format.	☑	Checkbox
port	Port number	502	Numeric
Printer mode	AGGREGATE_PRINTER: BUFFERED_PRINTER: LINEFORMAT:	BUFFERED_PRINTER	Drop-down list
printerUnit	Number of printer heads	1	Numeric
showDeviceFrame	Activates/deactivates the display of the device in the menu "overview".	☑	Checkbox

6.2.7.4 Zebra 170xiIII Printer

The Zebra 170xiIII Printer is editable under `System Settings > Edit device settings > (select <zebra 170xiIII printer tab>)`. At the tab menu on the top you can switch between the screens.

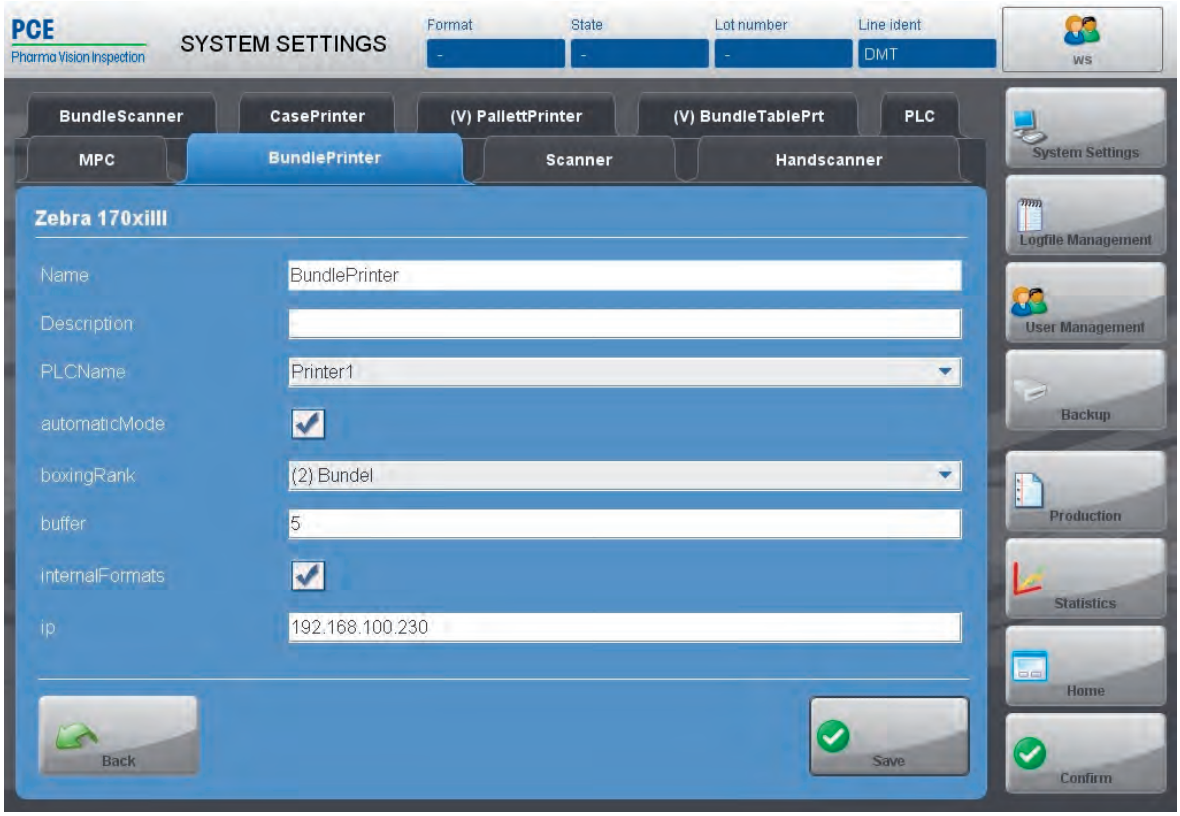


Figure: `System Settings > Edit device settings > (<select zebra 170xiIII printer tab>)`

Edit the settings at the input fields and scroll down menus. The table below gives an overview of these functions:

Parameter	Description	Default value	Allowed values
Description	Optional description	-	Alphanumeric
PLCName	Name of the printer for the PLC	-	Drop-down list
automaticMode	When automatic mode is active, manual operation of the device is not possible.	☑	Checkbox
boxingRank	Hierarchy level	(1) Unit	0 ... 3
buffer	Number of buffered printers	2	Numeric
internalFormats	Printer manages internal formats	☑	Checkbox
ip	IP address of the device		Valid IP address
labelPath	Path on which the label inventory is stored for the printer.	-	Valid Path
needDeviceFormat	Determines whether the device is jointly used in the line format.	☑	Checkbox
showDeviceFrame	Activates/deactivates the display of the device in the menu "overview".	☑	Checkbox

6.2.8 Cameras (A-3.6.2.8)

Cameras of PCE are the Smart Camera (**SMC**) and the **High Resolution Camera** (**HRC**). These can fulfill different functions depending on the corresponding settings.

6.2.8.1 Reader Modes

At this table the parameter 'readerMode' is described. This table is valid for hand scanners equally if the mode is available.

Mode	Function	Explanation	Device

PRINT_INSPECTION	Reads and checks static or serialized labels and its print quality if good or bad. Print inspection reader statistics are rank related.	The standard setting for most readers.	**SMC**, VGL, hand scanner (single item reader)
STATIC_INSPECTION	Reads and checks static (non serialized) labels and its print quality if good or bad.	Default setting for generic non serialized reader on global rank (rank 0). Static inspection should be used for non-item related label inspection. Reader statistic does not influence serialized label database status.	**HRC**, **SMC**, VGL, hand scanner (single and multiple item reader
PRINT_COMPARE	Previously printed units are further processed. Camera only reads the numbers and sends it to the PLM. SN verification is done by PLM instead of camera.	Already produced products are put in again without being printed before.	**SMC**, VGL, Scanner (single item reader)
AGGREGATE_READER	Reads several child unit labels one by one or at once and sends codes to PLM, verifies content size.	Standard setting for readers with rank > 1	**HRC**, **SMC**, VGL, hand scanner (single and multiple item reader)
LINKING_READER	deprecated	deprecated	deprecated
HC_INSPECTION	Reads and checks serialized helpercode labels and its print quality if good or bad.		**SMC**, VGL, hand scanner (single item reader)
HC_LINK_READER	Reads and checks serialized helpercode labels and its print quality if good or bad. Only in combination with SERIAL_LINK_READER.		**SMC**, VGL, hand scanner (single item reader)
HC_AGGREGATE_READER	Reads several child unit helpercode labels one by one or at once and sends codes to PLM, verifies content size.		**HRC**, **SMC**, VGL, hand scanner (single and multiple item reader)

SERIAL_LINK_READ-ER	Reads and checks serialized labels and its print quality if good or bad. Process is linking between current read code and helpercode label read before by HC_LINK_READER.	For example, this is helpful when you change the outer packaging and the existing codes can no longer be read. Then you can print helpercodes on the units, linked to the original code, to recognize the original code at the database. Precondition: a second reader must be set to the same rank an has to be in HC_LINK_READER.mode, which checks the PCE-helpercode label.	**SMC**, VGL, hand scanner (single item reader)
AGG_INSPECTION	Verifies the last processed aggregation by checking if an items is at an assumed position inside of a case.	At a case packer a **HRC** or **SMC** are used as aggregate inspection reader. This reader checks if a unit is at the expected position. E.g. the last unit is at the lower right of the case. If that is true this affirms that all units must be also right.	**HRC**, **SMC**, VGL, hand scanner (single item reader)
AGG_DELAY_PRINT	All children of a parent unit are aggregated. The parent label will not be printed until one child serial number is read by the AGG_DELAY_PRINT.	This mode can be used to label a unit with delay.	**SMC**, VGL (Single item reader)
HC_AGG_DELAY_P-RINT	All children of a parent unit are aggregated. The parent label will not be printed until one child helper code is read by the HC_AGG_DELAY_PRINT.	This mode can be used to label a unit with delay.	**SMC**, VGL, hand scanner (single item reader)
COPY_READER	Reads and checks serialized labels and its print quality if good or bad. Sends read serial number to a connected printer with printer mode: COPY_PRINTER.	Used for sending unknown serial numbers to a connected printer without buffering. A read code will be printed immediately.	**SMC**, VGL, hand scanner (single item reader)

DISTRIBUTION_READER	Compareable to COPY_READER but with internal buffering. This function is used for lines with reading of several labels at one item (e.g. helpercode) in same rank. It makes sense to use it if there are many items between camera and printer. Aim of this function: Avoiding waste of items when machine stops. All items between printer and camera can be avoided to be discarded. How it works: CAM1 (DISTRIBUTION_READER) reads all elements of the code (e.g. GTIN, expiry, serial number). The elements are verified (with the exception of the serial number). The serial number is only checked for attendance (by checking the length). Then the serial number is sent to CAM2 (DISTRIBUTION_CONSUMER). CAM2 checks the serial number received from CAM1 and sets the status to 'verified'. Problem: When both cameras would be in READER_MODE, the shift register would start at the printer. In case of an error all items from printer till CAM2 would have to be replaced. Solution: When CAM1 gets the serial numbers from CAM2 and not from the printer, the sequence of items between printer and CAM1 can be changed. So the shift register starts at CAM1. Thus in case of a machine stop, only the items between CAM1 and CAM2 have to be discarded.		**SMC**, VGL, hand scanner (single item reader)
DISTRIBUTION_CONSUMER	see DISTRIBUTION_READER		**SMC**, VGL, hand scanner (single item reader)
AGG_PRINT_INPECTION	Print Inspection Mode and Aggregation Reader		readers
PARITY_READER	Compares two or more equal pre-printed external serials	Two or more parity reader check for identical serials on a single unit. Used for china code without PLM printed helpercodes.	All readers

LINEFORMAT	LINEFORMAT is no reader mode. It is a switch to move the reader mode configuration from the global device setting to the line format. Setting LINEFORMAT as reader mode in the device settings (`System settings > Edit device settings > reader Mode`) allows to define the reader mode per line format.	The reader mode settings from the selected line format are used. Reader mode settings have to be made in the device details of the line format and are stored there.	All readers

6.2.8.2 Smart Camera (A-3.6.2.8.2)

The Smart Camera reads barcodes, data matrix codes and human readable text and compares it with the data received from the PLM. When the data is valid, the item is further processed. If data is unvalid, the item will be discarded. The Smart Camera is editable under `System Settings > Edit device settings > (<select smart camera tab>)`. At the tab menu on the top you can switch between the screens.

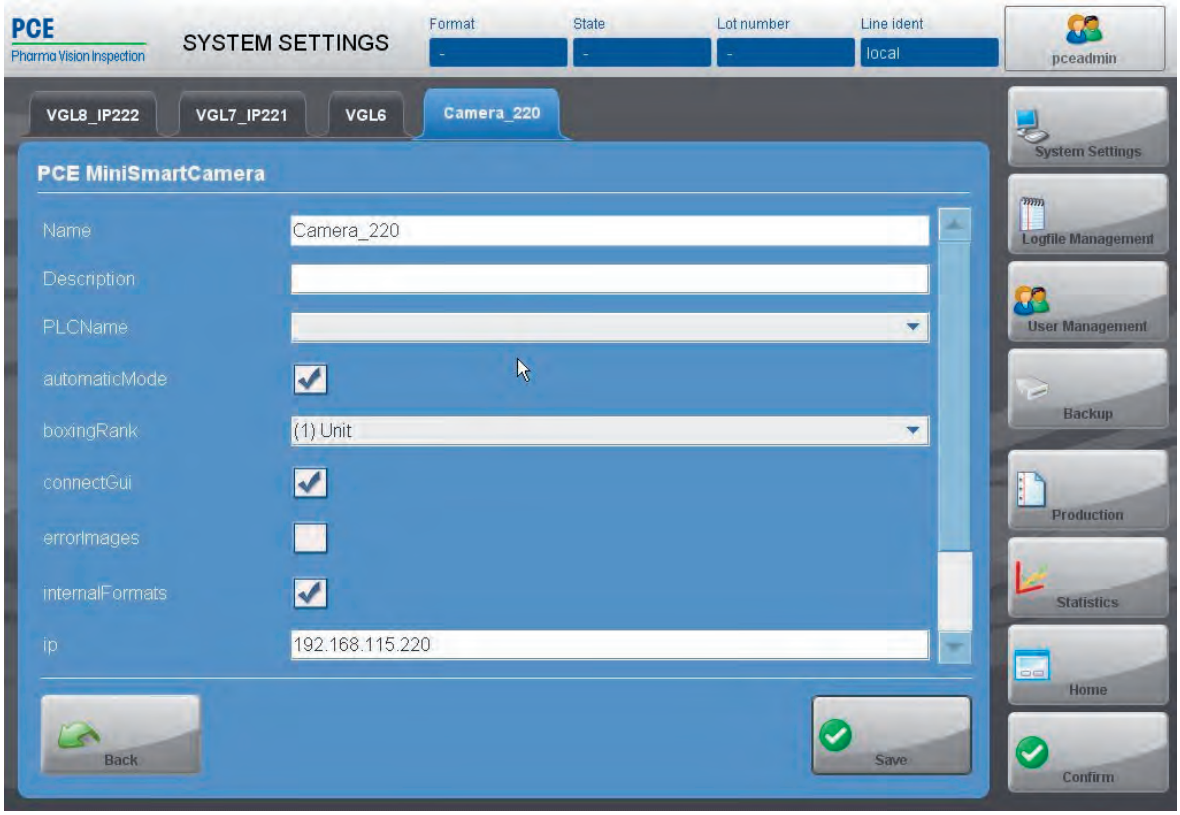


Figure: `System Settings > Edit device settings > (<select smart camera tab>)`

Edit the settings at the input fields and scroll down menus. The table below gives an overview of these functions:

Parameter	Description	Default value	Allowed values
Name	Name that has been assigned in the device management settings	Camera	Alphanumeric
Description	Optional description	-	Alphanumeric
PLCName	Name of the printer for the PLC	Cam1	Drop-down list
autoVerifyAggUnit	Possibility of combining with one reading process the verification and commission into the database.	☐	Checkbox
automaticMode	When automatic mode is active, manual operation of the device is not possible.	☑	Checkbox
boxingRank	Hierarchy level	(1) Unit	Drop-down list
ConnectGui	Activates/deactivates the image processing on the camera	☑	Checkbox

debugStatistics	Stores communication between the Pilot Line Manager and the camera in txt data. Only for error searches, otherwise this should be switched off.	☐	Checkbox
errorImages	Activates/deactivates the permanent storage of MSC error images in the Pilot database	☐	Checkbox
internalFormats	Camera manages internal formats	☑	Checkbox
ip	IP address of the device	192.168.100.215	Valid IP address
needDeviceFormat	Device appears on the line format	☑	Checkbox
preAggregationReject	Units scanned by aggregation reader are validated direct after read and rejected by PLC. Default the validation process starts with the covering box close signal (content size is reached or close button)	☐	Checkbox
readerMode	PRINT_INSPECTION AGGREGATE_READER LINKING_READER AGG_INSPECTION LINEFORMAT	PRINT_INSPECTION	Drop-down list
showDeviceFrame	Activates/deactivates the display of the device in the menu "overview".	☑	Checkbox
useWildcards	Activates/deactivates the transfer of the serial number through a placeholder (*****) it is only checked for length, not for contents.	☑	Checkbox

6.2.8.3 Aggregation with Smart Camera

Aggregation of items to a case can also be done via Smart Camera. This feature will only be implemented for the latest Smart Camera generation (150, 205, 206, 215). To achieve this, the camera uses its subset and set to store serial numbers temporarily. The aim is to send the complete set of serial numbers to the PLM only after the case was closed, while filling a new case in the meantime.

How it works

The aggregation process via Smart Camera is described in the Flowchart below (See Figure 6-17: Aggregation with Smart Camera (page 55)).

Parameter	Actions by SMC	Processing in SMC and PLM
Filling Case (A)	Capturing Items (for Case A)	Save SNs to Subset
Case A filled	-	Transfer SNs from Subset to Set
Filling new case (B)	Capturing Items (for Case B)	Save SNs to Subset
Case (A) complete	-	Transfer SNs from Set to PLM, check and Aggregate SNs
Keep on filling new case (B)	Capturing Items (for Case B)	Save SNs to Subset…

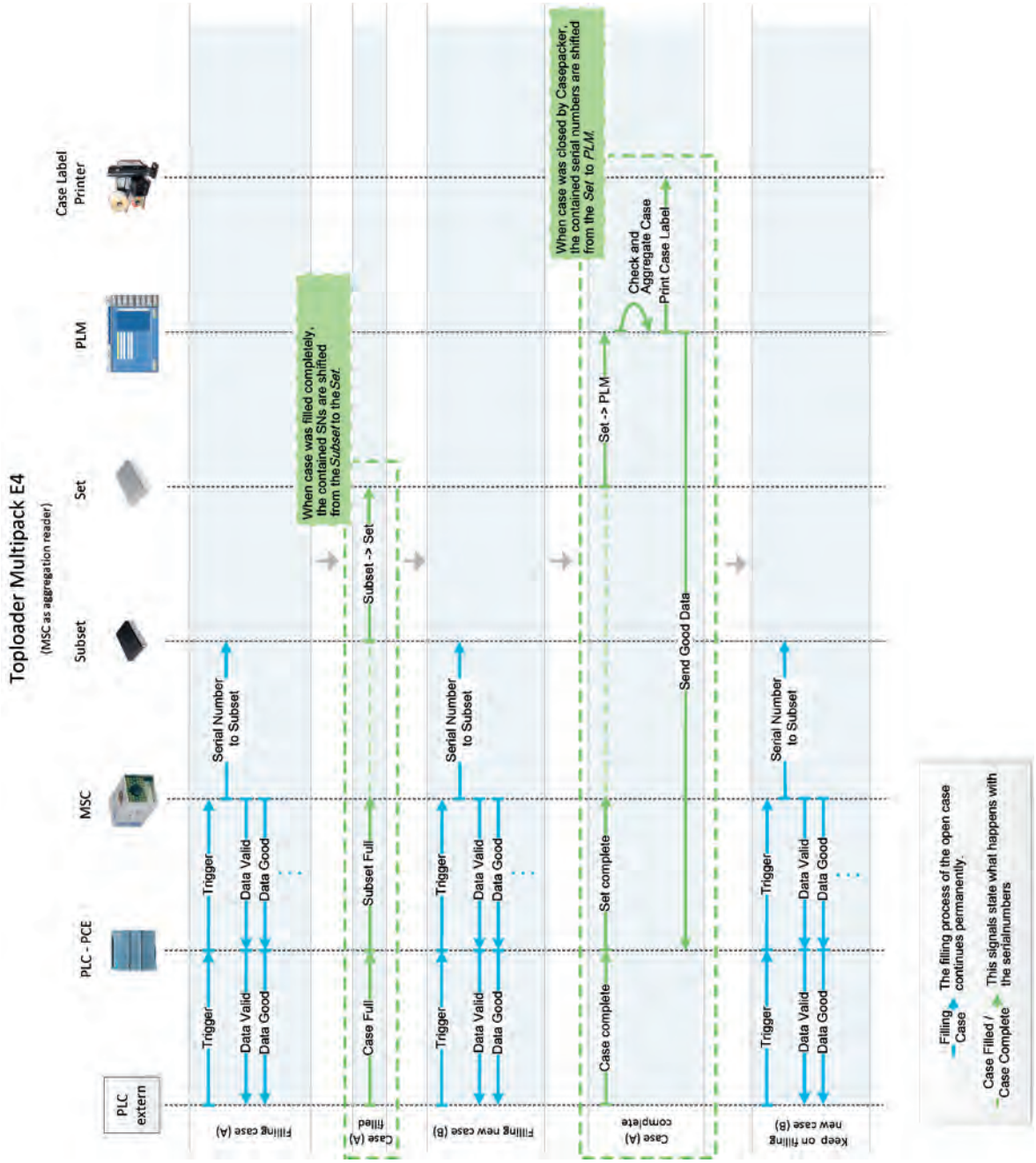


Figure 6-17: Aggregation with Smart Camera

6.2.8.4 Setting up a Product in SMC (H-1.6)

This chapter describes how to set up a product in the Smart Camera. Some step sequences have to be repeated in order to set several fields. For this the steps are numbered.

Step	Action
1	Press Home.

Figure: Home

Step	Action
2	Select the camera bar.

The following screen appears (It may be that the software automatically skips this screen. In this case you do not need to press menu at this point and you see the subsequent screen):

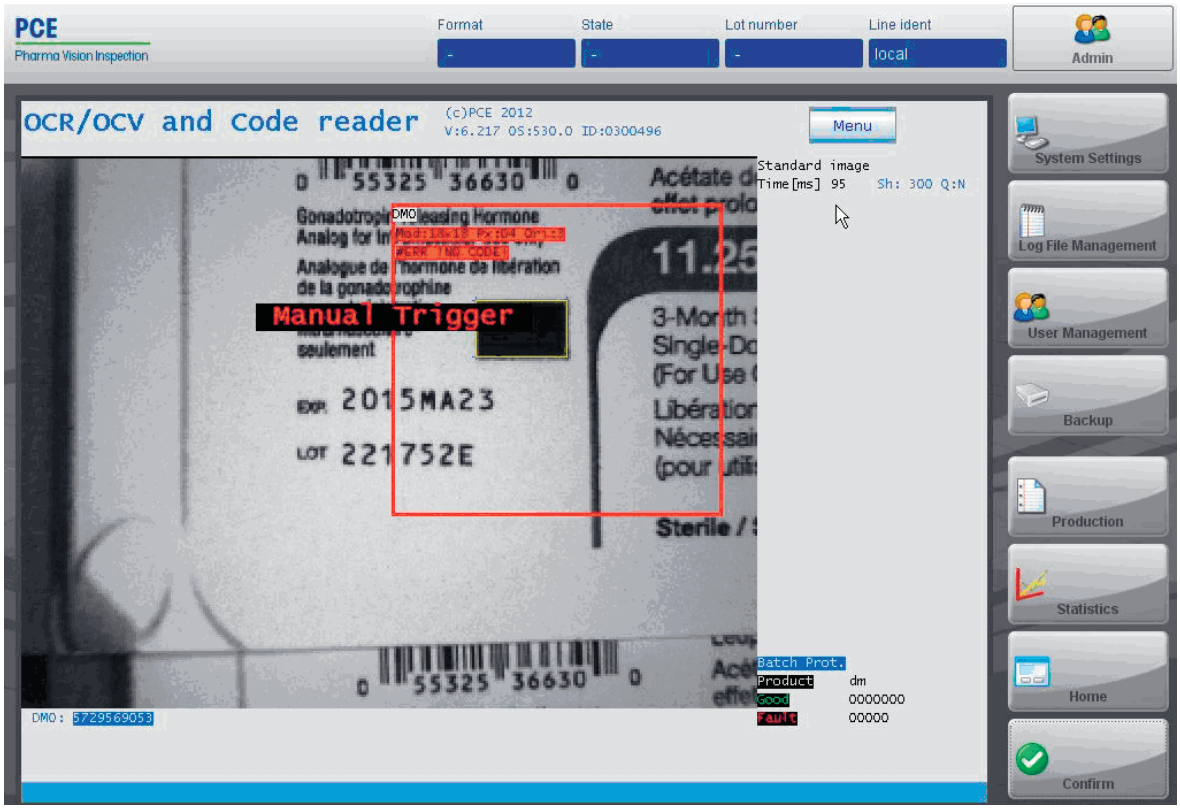


Figure: Home > (<select smart camera bar>)

Step	Action

3	Press `Menu`.

The following screen appears:

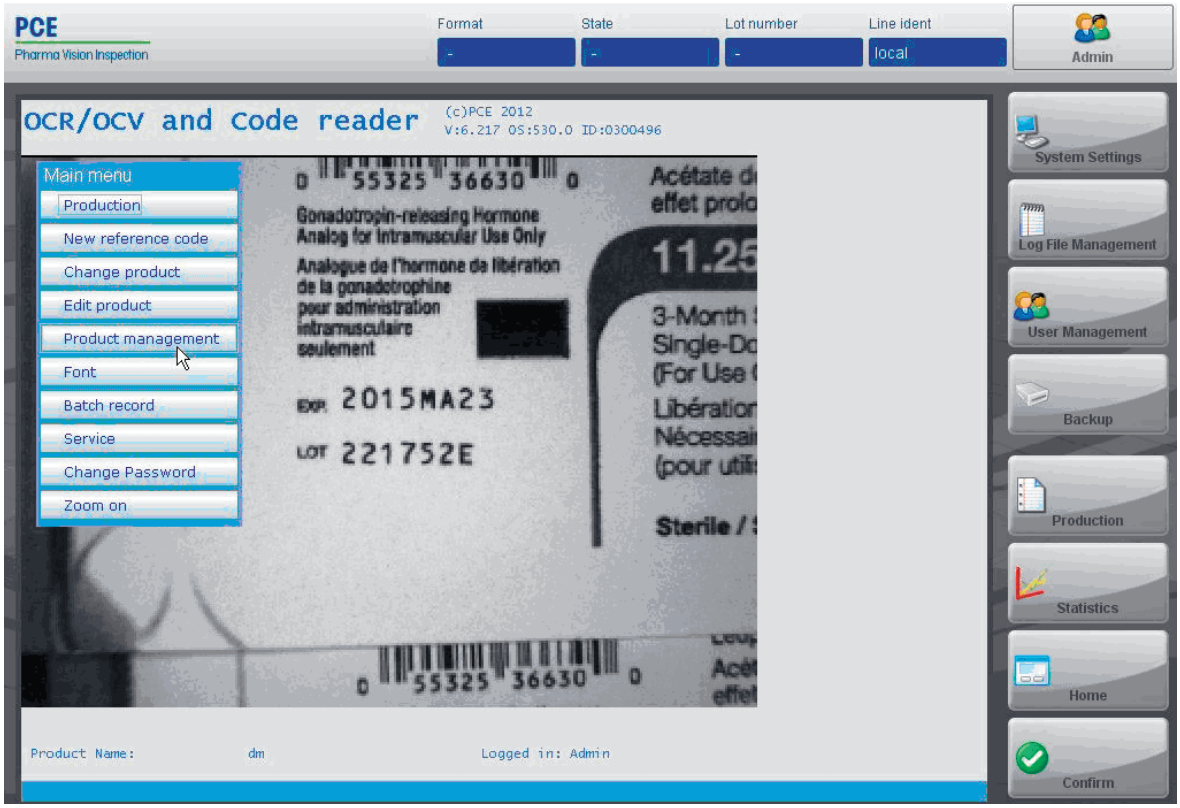


Figure: `Home > (<select smart camera bar>) > Menu`

Step	Action
4	Press `Product management`.

The following screen appears:

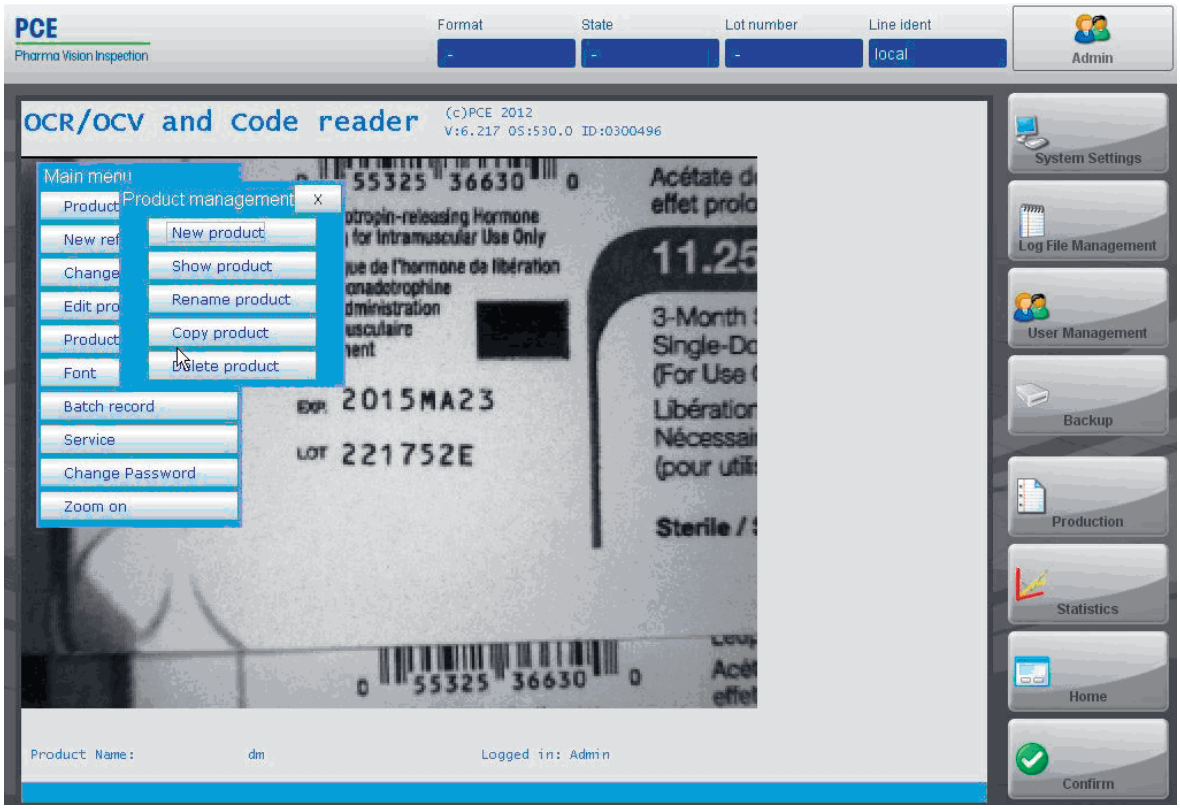


Figure: Home > (<select smart camera bar>) > Menu > Product management

Step	Action
5	Press New product.

The following dialog (New product name) appears:

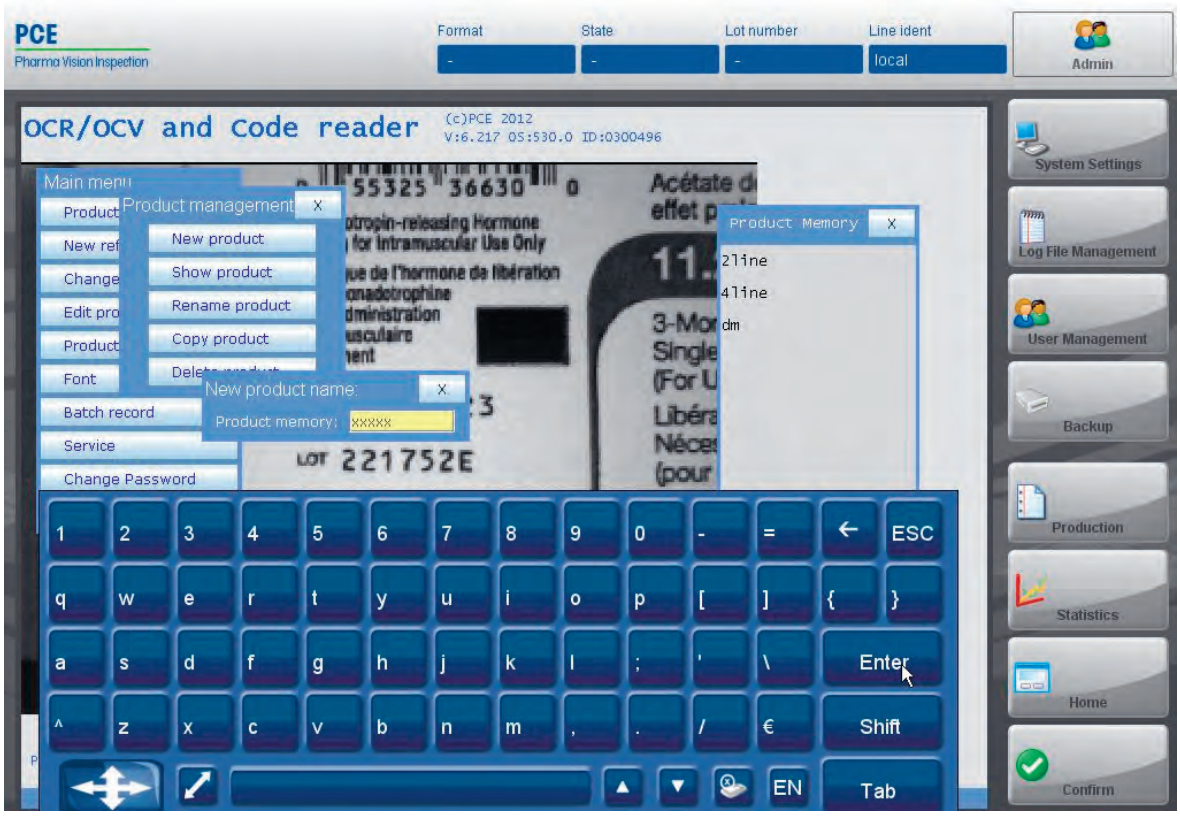


Figure: Home > (<select smart camera bar>) > Menu > Product management > New product

Step	Action

6	Enter a unique product name.
7	Press Enter on the keyboard.

The following dialog (`Live image`) appears:

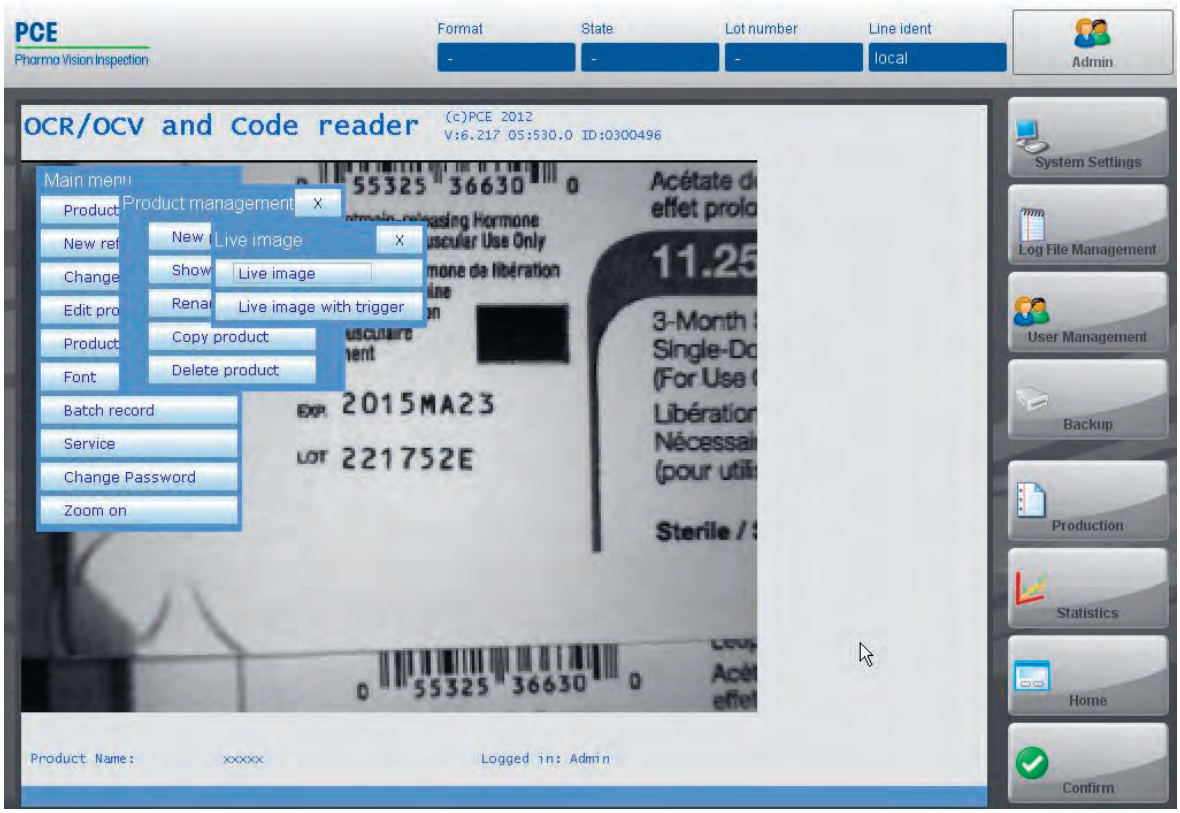


Figure: `Home > (<select smart camera bar>) > Menu > Product management > New product > (enter product name) > Enter (at the keyboard)`

Step	**Action**
8	Select live Image.
9	Place item underneath the Smart Camera.

The following screen appears:

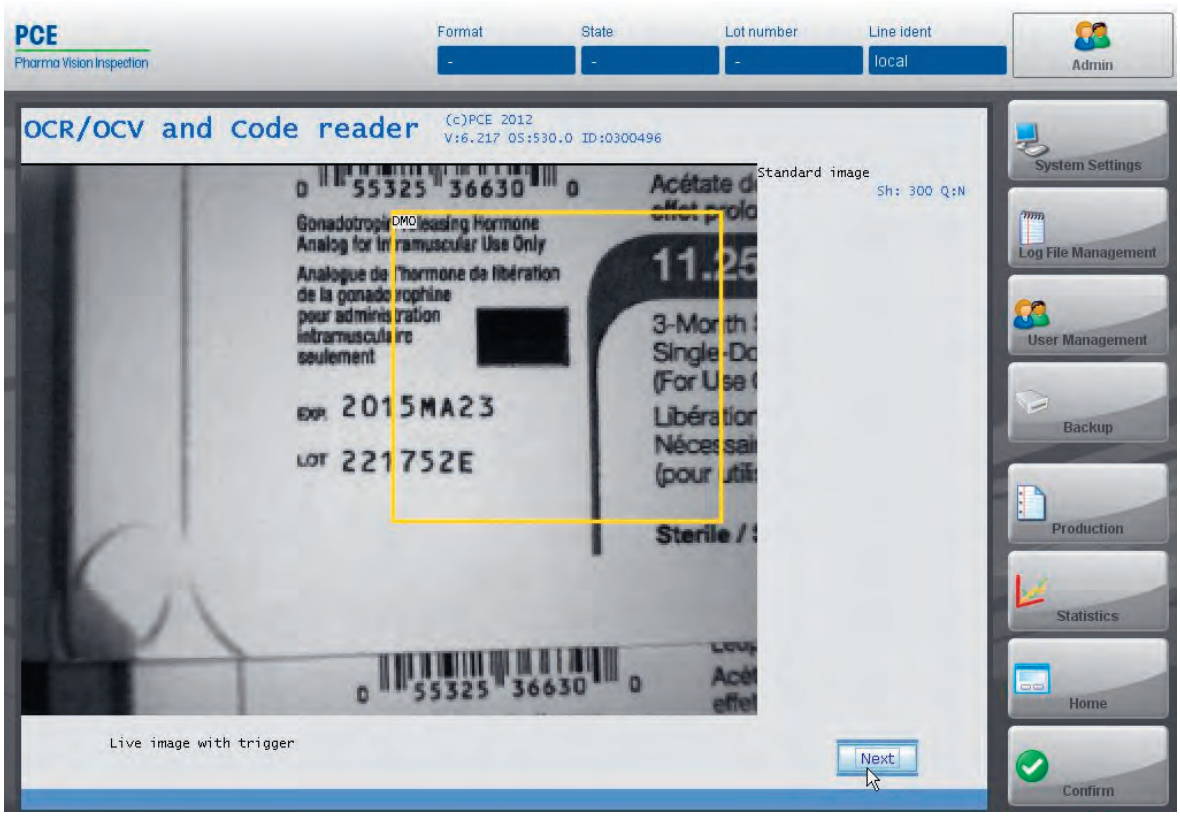


Figure: Home > (<select smart camera bar>) > Menu > Product management > New product > (enter product name) > Enter (at the keyboard) > Live Image

Step	Action
10	Select Next.

The following dialog (Control) appears:

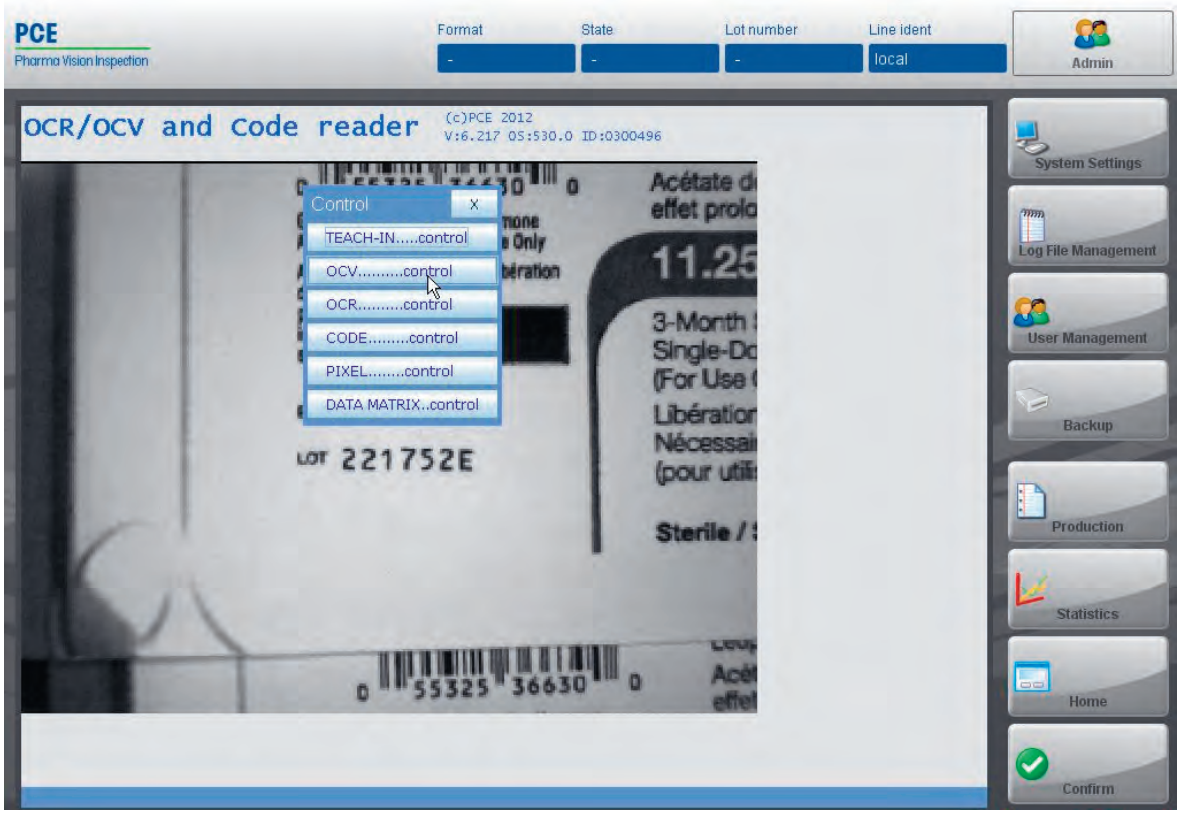


Figure: Home > (<select smart camera bar>) > Menu > Product management > New product > (enter product name) > Enter (at the keyboard) > Live Image > Next

Step	Action
11	Press OCV control.

The screen looks as follows:

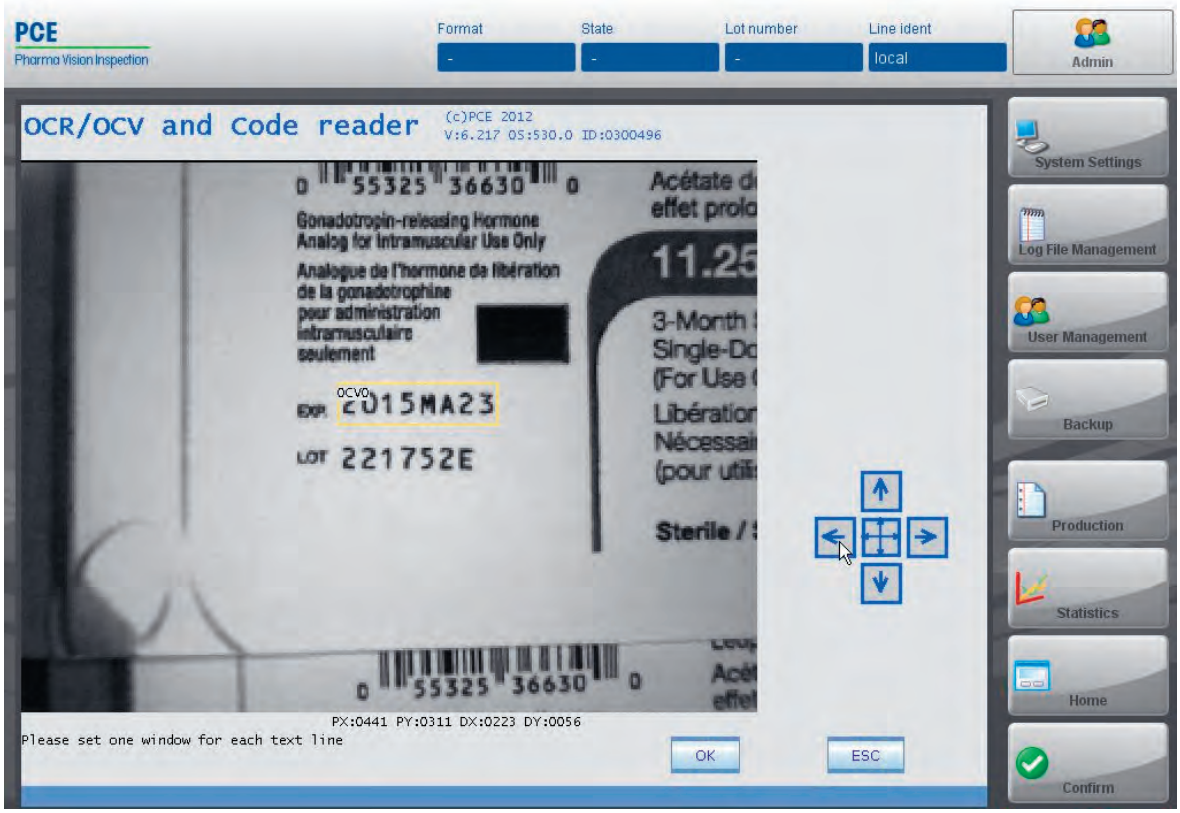


Figure: `Home > (<select smart camera bar>) > Menu > Product management > New product > (enter product name) > Enter (at the keyboard) > Live Image > Next > OCV control`

To set the control window for the expiry date proceed as follows.

Step	Action
12	Move the yellow control window in a way that it is arranged around the expiry date. See below.

To set the control window you can use the navigation arrow keys as described in the following table. You can also move the control window and adjust its borders by dragging and dropping the borders.

Button		Function
		Navigation arrow keys for functions at the modes. The mode is selected at the button in the middle.
Button	Mode	
	'scrolling'	The control window can be moved using the arrow keys.
	'zoom in'	The control window can be enlarged using the arrow keys.
	'zoom out'	The control window can be reduced using the arrow keys.

Step	Action
13	After the control window is set to the right position, press OK to confirm.

The following Dialog (Threshold) appears:

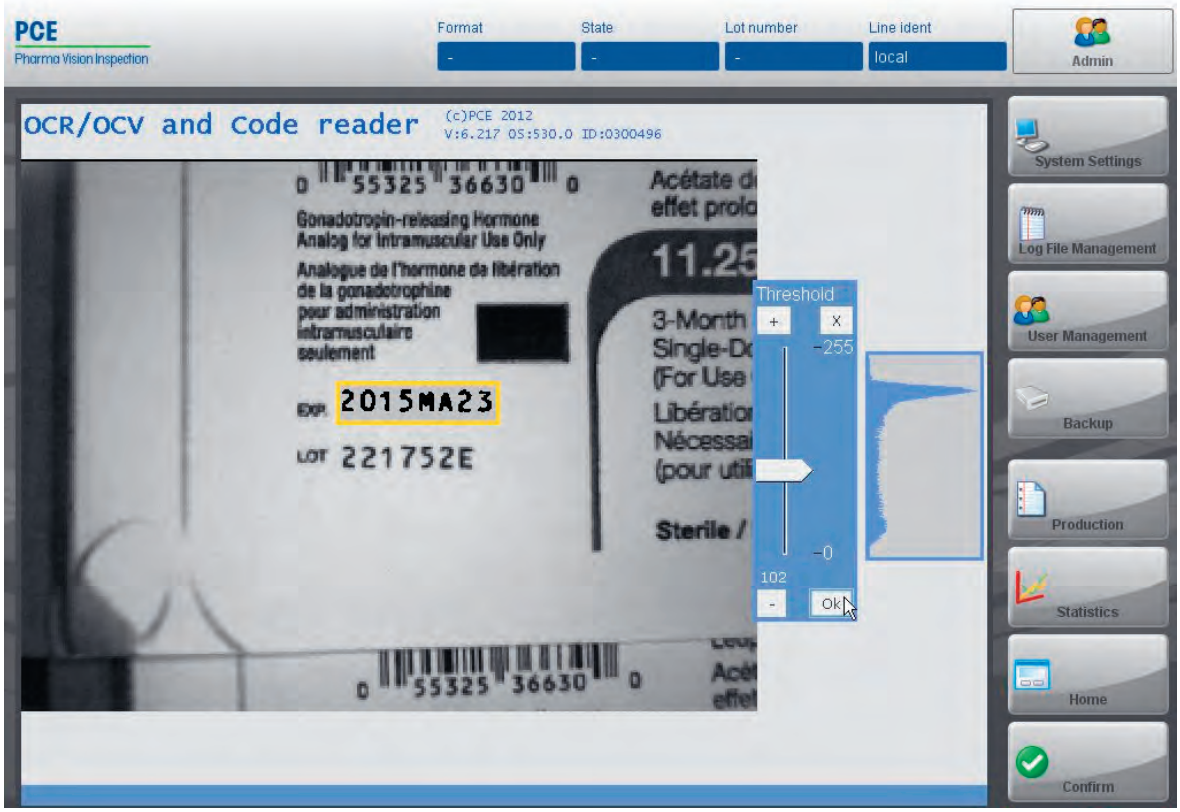


Figure: Home > (<select smart camera bar>) > Menu > Product management > New product > (enter product name) > Enter (at the keyboard) > Live Image > Next > OCV control (arrange control window) > OK (set threshold)

Step	Action
14	Move threshold in a way until you can clearly read the font.
15	Then press OK to confirm.

The following dialog (Window with measuring arrows?) appears:

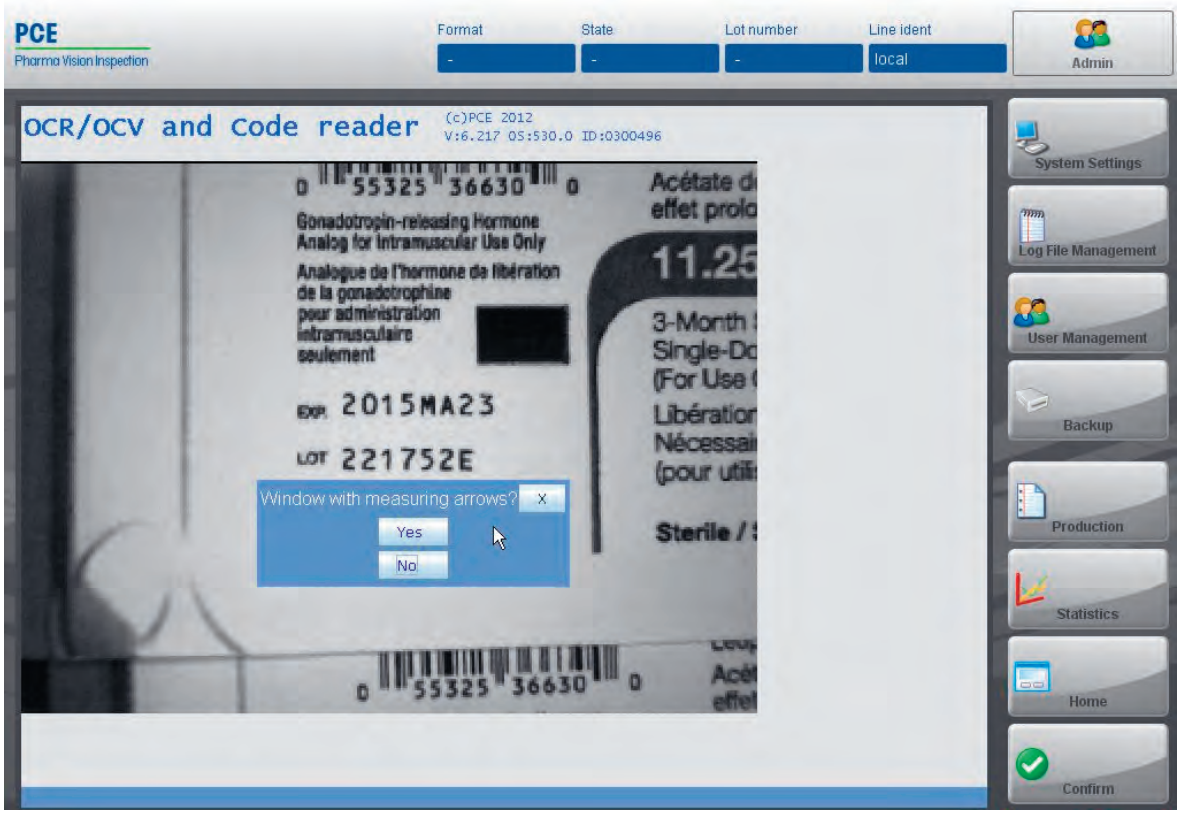


Figure: `Home > (<select smart camera bar>) > Menu > Product management > New product > (enter product name) > Enter (at the keyboard) > Live Image > Next > OCV control (arrange control window) > OK (set threshold) > OK`

Step	Action
16	Select `Yes`.

After pressing Yes, the following dialog (Font Memory) appears:

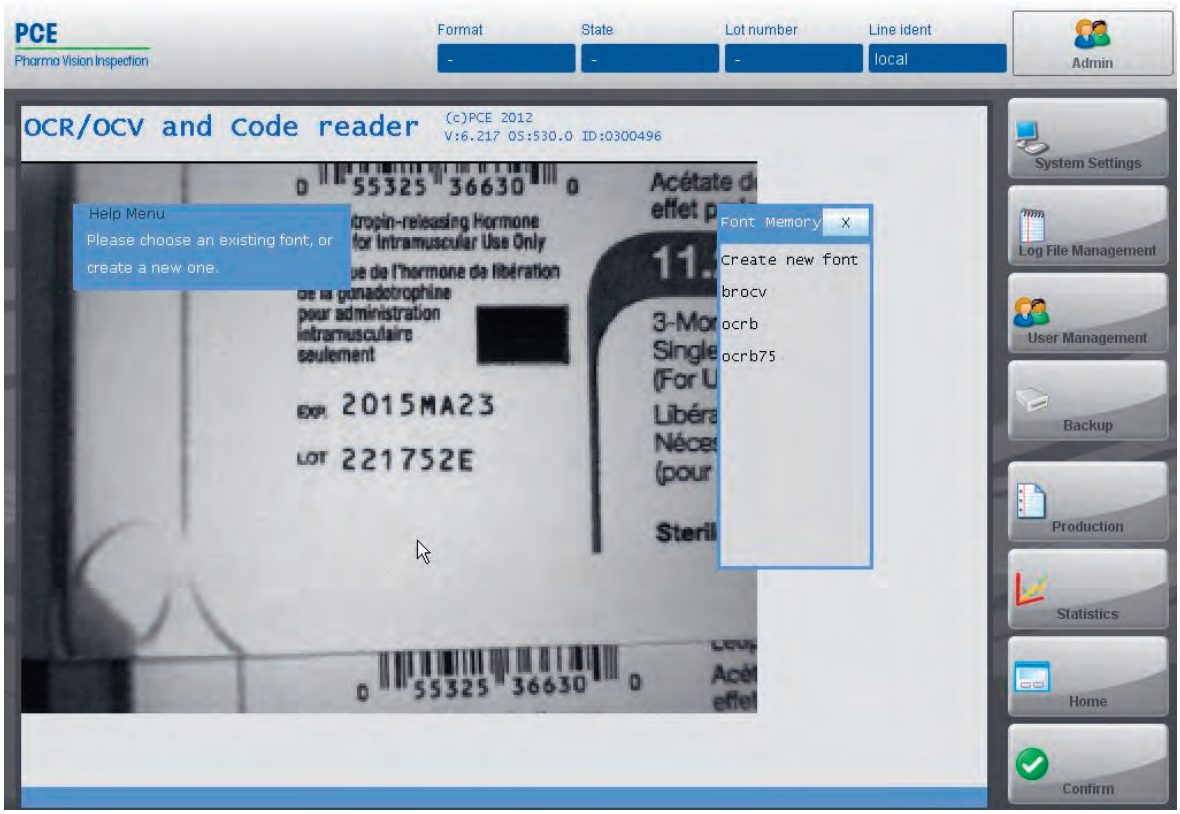


Figure: Home > (<select smart camera bar>) > Menu > Product management > New product > (enter product name) > Enter (at the keyboard) > Live Image > Next > OCV control (arrange control window) > OK

At this dialog you have to choose the font memory you would like to use.

Step	Action
17	Select ocrb.

The following dialog (Prepare another control?) appears:

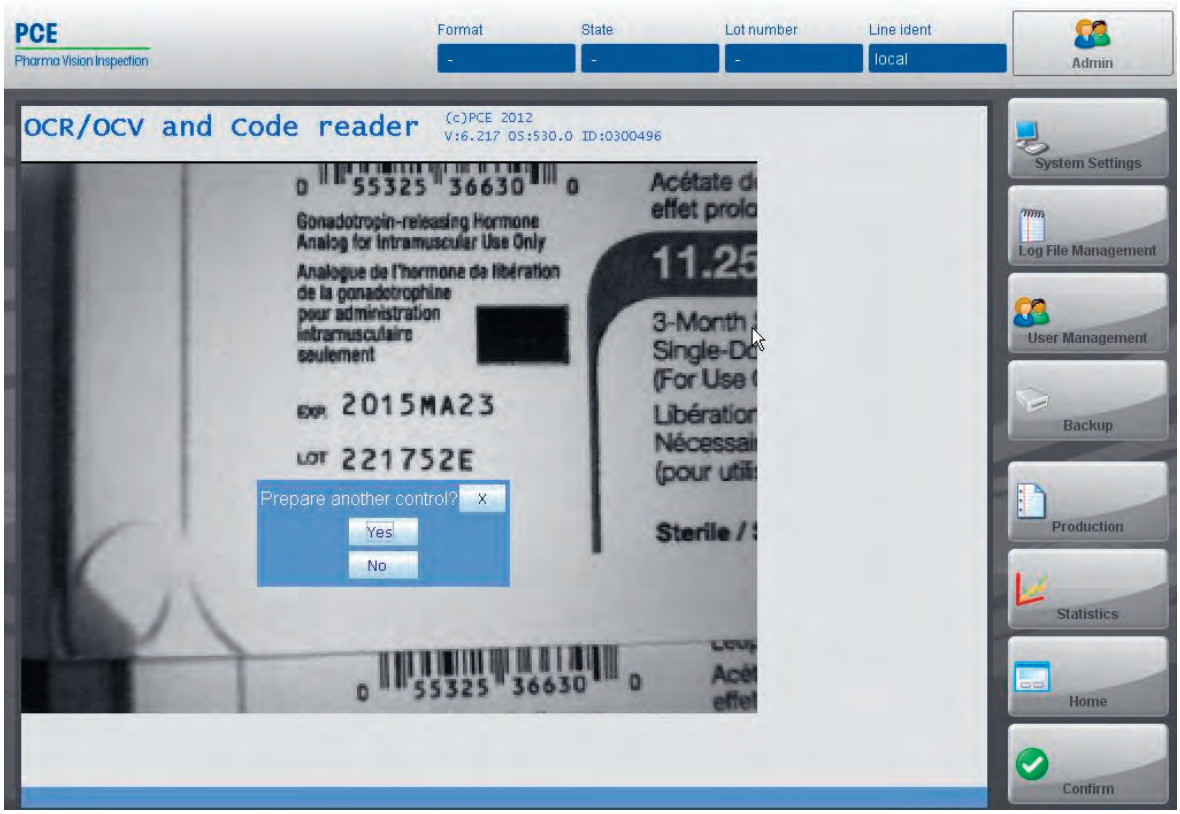


Figure: `Home > (<select smart camera bar>) > Menu > Product management > New product > (enter product name) > Enter (at the keyboard) > Live Image > Next > OCV control (arrange control window) > OK (set threshold) > OK > Yes (select font memory)`

To set another control window for the <LOT> field you have to repeat the steps (11-15).

Step	Action
18	Press`Yes.` (You are automatically led back to proceed from step 11)
19	Repeat steps 11–15

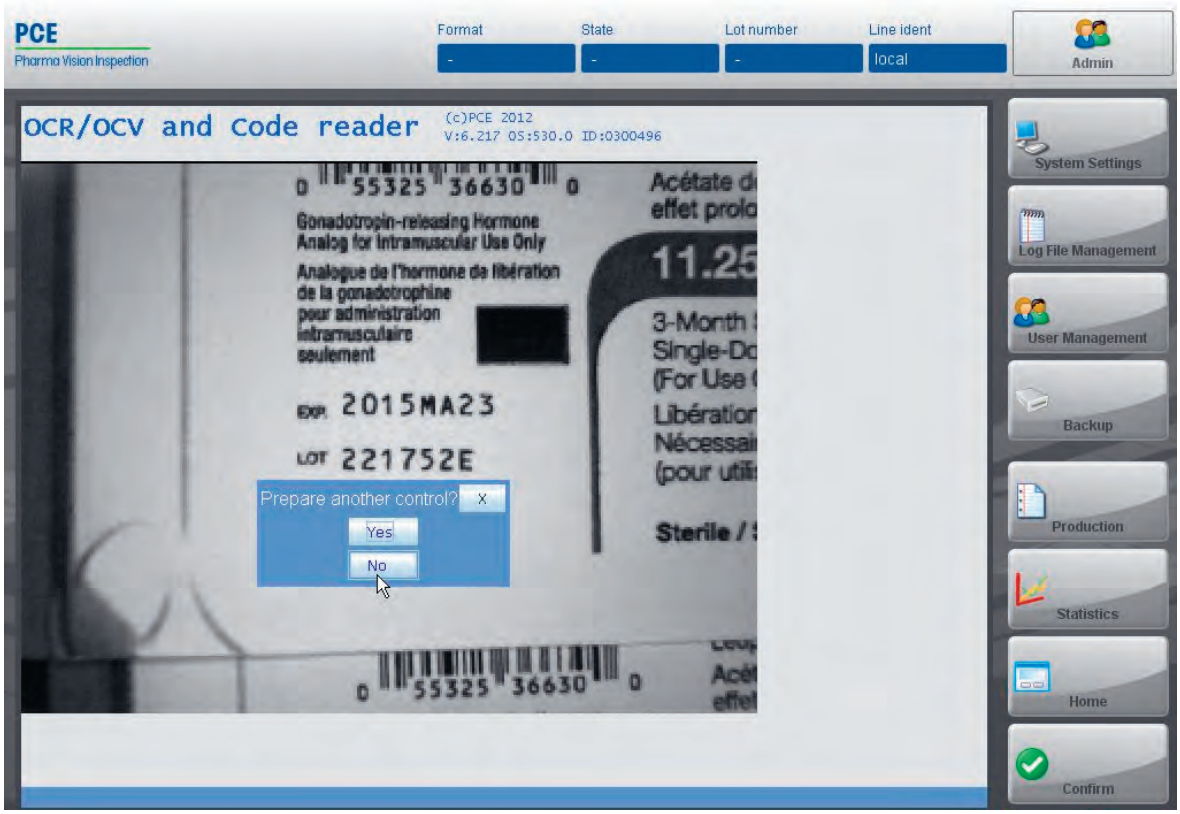


Figure: Home > (<select smart camera bar>) > Menu > Product management > New product > (enter product name) > Enter (at the keyboard) > Live Image > Next > OCV control (arrange control window) > OK (set threshold) > OK > Yes (select font memory)

Step	Action
20	Select No.

The following screen appears:

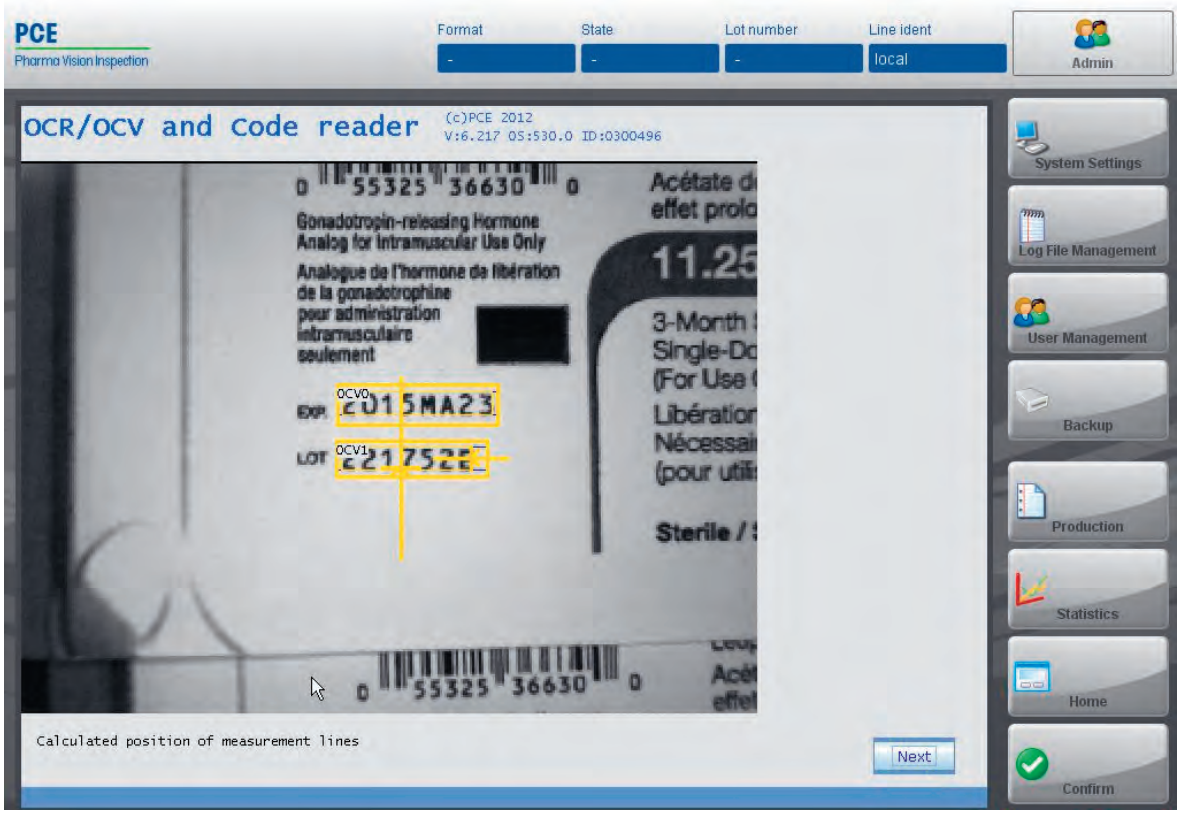


Figure: Home > (<select smart camera bar>) > Menu > Product management > New product > (enter product name) > Enter (at the keyboard) > Live Image > Next > OCV control (arrange control window) > OK (set threshold) > OK > Yes (select font memory) > No

At this screen you see the calculated position of measurement lines.

Step	Action
21	Press Next to leave the screen.

After pressing next you get to the following screen:

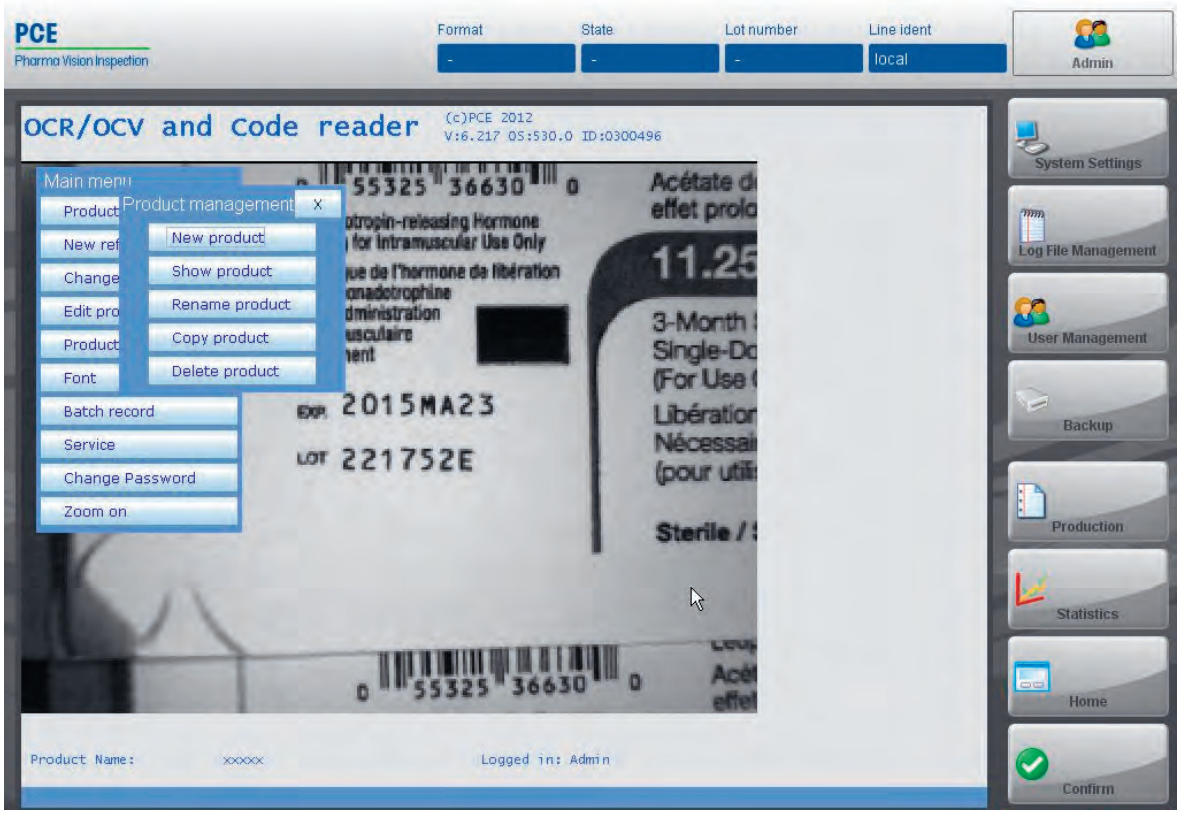


Figure: Home > (<select smart camera bar>) > Menu > Product management > New product > (enter product name) > Enter (at the keyboard) > Live Image > Next > OCV control (arrange control window) > OK (set threshold) > OK > Yes (select font memory) > No > Next

You can return to production or add a new control window. To add another control window press Add control window. You will be redirected to step 11. To return to production close the Product management dialog by pressing x and press Production at the Main Menu dialog.

6.2.8.5 High Resolution Camera

The **High Resolution Camera** is editable under System Settings > Edit device settings > (select <megapixel camera tab>). At the tab menu on the top you can switch between the screens.

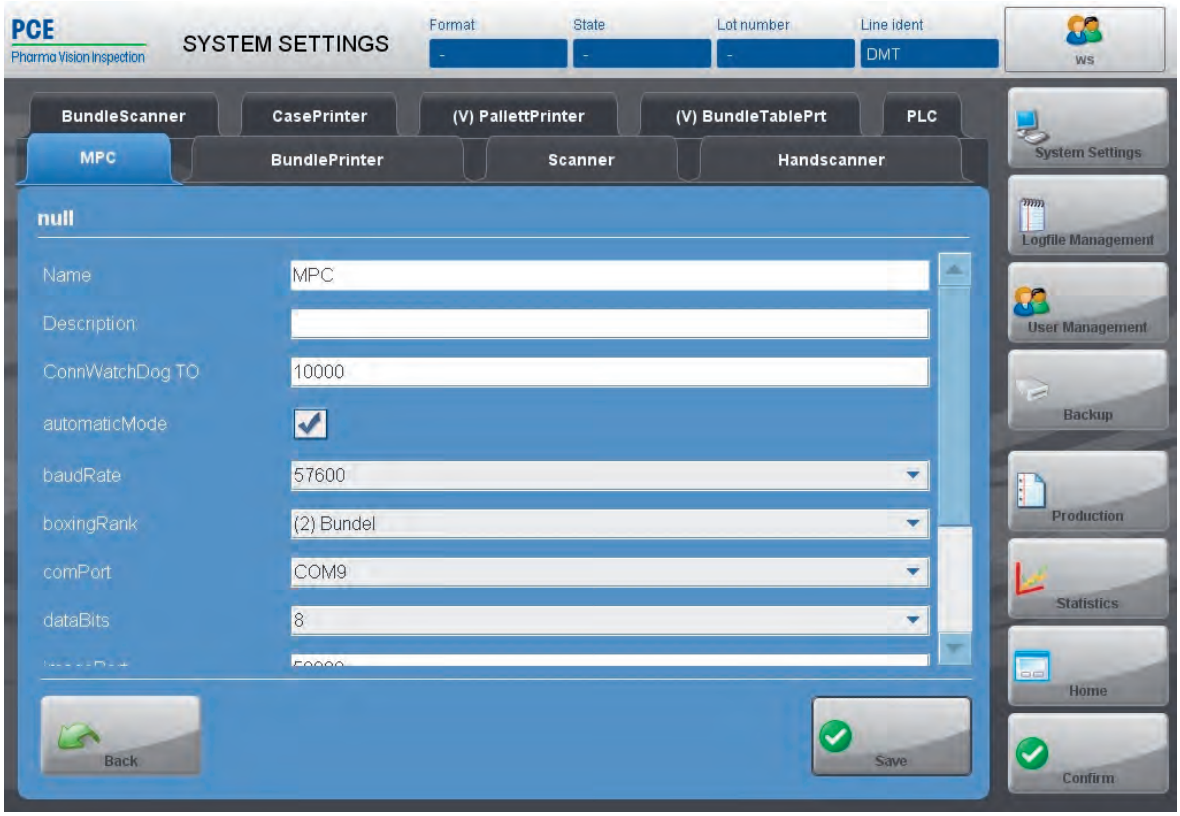


Figure: `System Settings > Edit device settings > (select <megapixel camera tab>).`

Edit the settings at the input fields and scroll down menus. The table below gives an overview of these functions:

Parameter	**Description**	**Default value**	**Allowed values**
Name	Name that has been assigned in the device management settings	**HRC**	Alphanumeric
Description	Optional description	-	Alphanumeric
ConnWatchDogTO	Customizable time WatchDog [ms]	10000	Numeric
PLCName	Select suitable value	-	Drop-down list
autoVerifyAggUnit	Possibility of combining with one reading process the verification and commission into the database.	☐	Checkbox
automaticMode	When automatic mode is active, manual operation of the device is not possible.	☑	Checkbox
baudRate	Baud rate between Camera and IPC	57600	Drop-down list
boxingRank	Hierarchy level	(2) Bundle	Drop-down list
comPort	Sets the COM Port to that to which the camera is connected.	COM2	Drop-down list
Image Port	for TCPIP connection	50000	Numeric
Internal Formats	Camera manages internal formats	☑	Checkbox
needDeviceFormat	Determines whether the device is jointly used in the line format.	☑	Checkbox
preAggregationReject	Units scanned by aggregation reader are validated direct after read and rejected by PLC. Default the validation process starts with the covering box close signal (content size is reached or close button)	☐	Checkbox
Parity	RS232 value (EVEN/MARK/NONE/ODD/SPACE)	None	Drop-down list

readerMode	PRINT_INSPECTION / AGGREGATE_READER / LINKING_READER / AGG_INSPECTION / LINEFORMAT See "Smart Camera"	AGGRAGATE_READ-ER	Drop-down list
StopBits	RS232 value (1/2/3)	1	Drop-down list
showDeviceFrame	Activates/deactivates the display of the device in the menu "overview".	☑	Checkbox

6.2.9 Use cases for Printer/Reader Modes with China Coding

	Printer A Serial Number	**Printer B** Helper Code	**Reader A1** Serial Number	**Reader B1** Helper Code	**Reader A2** Serial Number	**Reader B2** Helper Code
Use case 1	Printer B prints helper codes (HC), reader A2 reads external pre-printed china serial (SN) and Reader B2 link PLM generated HC with china serial. Both readers must be triggered for all units and reader B2 trigger generate new HC into printer B buffer. Position and order sequence of reader A2 and B2 is flexible. Good/bad IO signal of reader A2 and B2 are merged to eject after last reader position.					
mode		HC_ PRINTER			LINKING_ READER	LINKING_ READER
readOnly					yes	no
lineformat (SN mapping)		R21			21	R21
Use case 2	Reader A2 reads external pre-printed china serial (SN) and reader B2 link external generated HC with china serial. Both readers must be triggered for all units. Position and order sequence of reader A2 and B2 is flexible. Good/bad IO signal of reader A2 and B2 are merged to eject after last reader position.					
mode					LINKING_ READER	LINKING_ READER
readOnly					yes	yes
lineformat (SN mapping)					21	R21
Use case 3	Printer B prints helper codes (HC), reader A2 reads external pre-printed china serial (SN) and reader B2 link PLM generated HC with china serial. Reader A2 and B2 must be synchronized triggered for all units and reader B1 trigger generate new HC into printer B buffer. Position and order sequence of reader A2 and B2 is flexible. Good/bad IO Signal of reader A2 and B2 are merged to eject after last reader position.					
mode		HC_ PRINTER		HC_ INSPECTION	LINKING_ READER	LINKING_ READER
readOnly				no	yes	yes
lineformat (SN mapping)		R21		R21	21	R21
Use case 4	Printer A prints china serials, printer B prints helper codes (HC), reader A2 reads internal china serial (SN) and reader B2 link PLM generated HC with PLM china serial. Both readers must be triggered for all units and reader B2 trigger generate new HC into printer B buffer and also generate new serials into printer A buffer. Position and order sequence of reader A2 and B2 is flexible. Good/bad IO signal of reader A2 and B2 are merged to eject after last reader position.					
mode	BUFFERED_P-RINTER	HC_ PRINTER			LINKING_ READER	LINKING_ READER
readOnly					no	no
lineformat (SN mapping)	21	21			21	R21

Use case 5	Printer A prints china serials, printer B prints helper codes (HC), reader A2 reads internal china serial (SN) and reader B2 link PLM generated HC with PLM china serial. Both readers must be triggered for all units and reader B1 trigger generate new HC into printer B buffer and reader A1 generate new serials into printer A buffer. Position and order sequence of reader A2 and B2 is flexible. Good/bad IO signal of reader A2 and B2 are merged to eject after last reader position.					
mode	BUFFERED_PRINTER	HC_ PRINTER	PRINT_ INSPECTION	HC_ INSPECTION	LINKING_ READER	LINKING_ READER
readOnly			no	no	no	no
lineformat (SN mapping)	21	R21	21	R21	21	R21

6.2.10 Hand Scanner (A-3.7.9.4)

The hand scanner is editable under `System Settings > Edit device settings > (Select <hand scanner tab>)`. At the tab menu on the top you can switch between the screens.

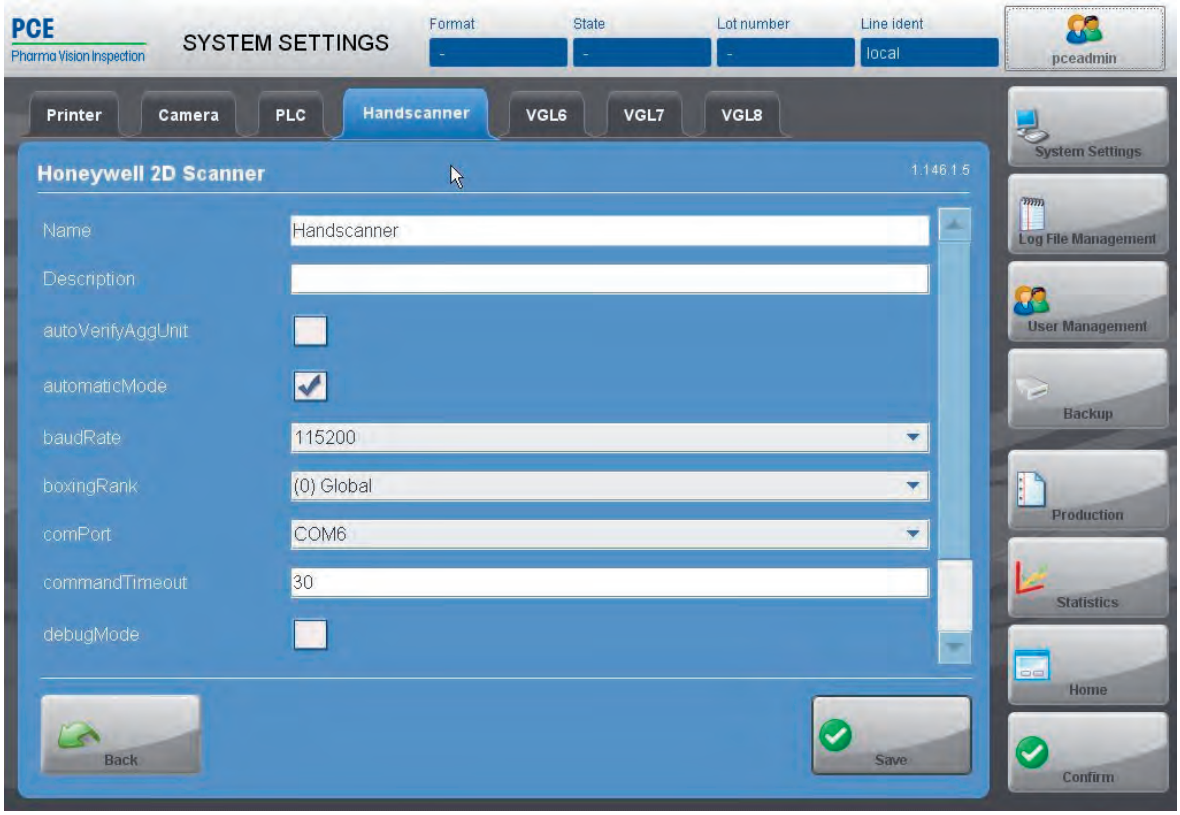


Figure: `System Settings > Edit device settings > (Select <hand scanner tab>)`

Edit the settings at the input fields and scroll down menus. The table below gives an overview of these functions:

Parameter	Description	Default value	Allowed values
Name	Name that has been assigned in the device management settings	-	Alphanumeric
Description	Optional description	-	Alphanumeric
autoVerifyAggUnit	Possibility of combining with one reading process the verification and commission into the database.	☐	Checkbox
automaticMode	When automatic mode is active, manual operation of the device is not possible.	☑	Checkbox
baudRate	Baud Rate between Scanner and IPC	38400	Drop-down list
boxingRank	Hierarchy level	(0) Global	Drop-down list
comPort	Describes the COM Port the Scanner is connected to.	COM2	Drop-down list

commandTimeout	After this time [s] the scanner resets the actual command	30	Numeric
debugMode	Possibility of blending in/out the button „Debug Console". The Debug surface enables analysis of read-in codes.	☐	Checkbox
needDeviceFormat	At the moment without any meaning	☐	Checkbox
preAggregationReject	Units scanned by aggregation reader are validated direct after read and rejected by PLC. Default the validation process starts with the covering box close signal (content size is reached or close button)	☐	Checkbox
readerMode	PRINT_INSPECTION AGGREGATE_READER LINKING_READER AGG_INSPECTION LINEFORMAT See "Smart Camera"	PRINT_INSPECTION	Drop-down list
showDeviceFrame	Activates/deactivates the display of the device in the menu "overview".	☑	Checkbox

6.2.11 Checkweigher

The checkweigher is editable under `System Settings > Edit device settings > (Select <checkweigher tab>)`. At the tab menu on the top you can switch between the screens.

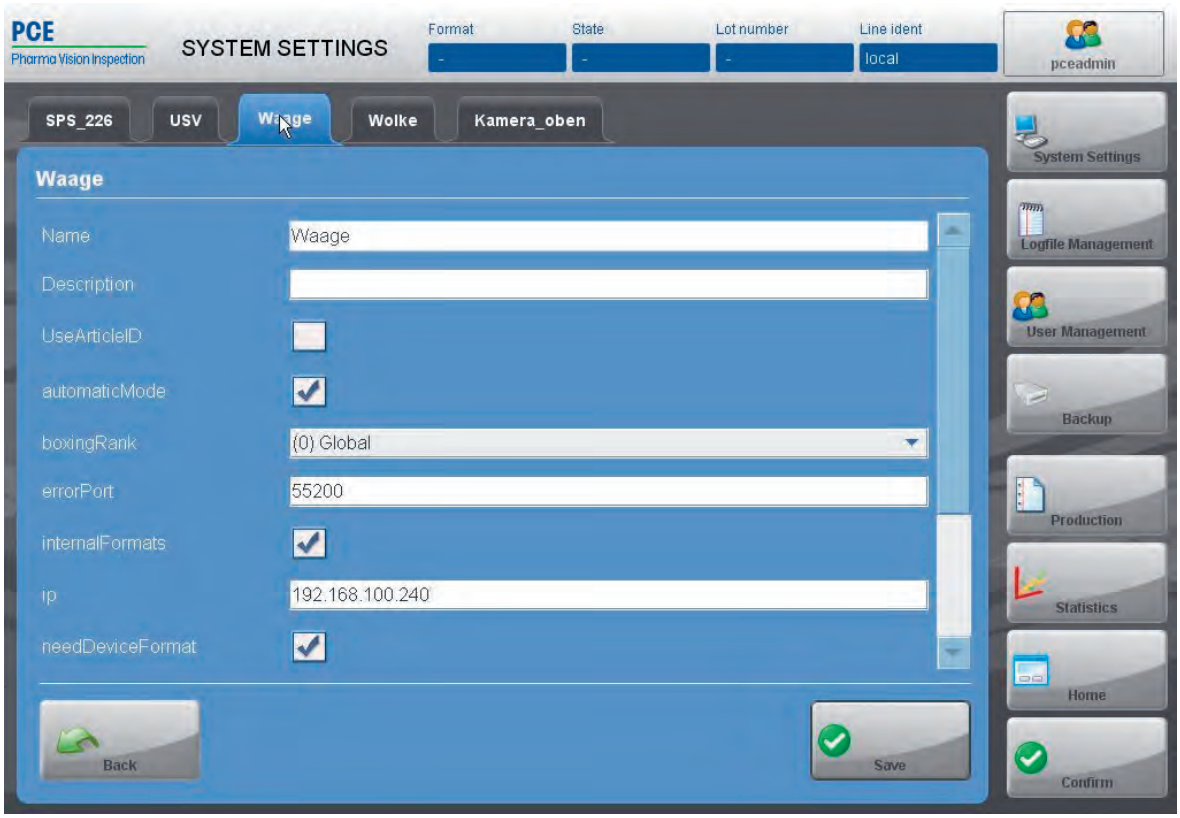


Figure: `System Settings > Edit device settings > (select <checkweigher tab>)`

Edit the settings at the input fields and scroll down menus. The table below gives an overview of these functions:

Parameter	Description	Default value	Allowed values
Description	Optional description	-	Alphanumeric

UseArticleID	Information about usage of article ID or article name in line format	☐	Checkbox
automaticMode	Must always be set (checkmark).	☑	Checkbox
boxingRank	Hierarchy level	(0) Global	Drop-down list
errorPort	Connection to error report service	55200	Numeric
InternalFormats	The scanner uses internal formats	☐	Checkbox
ip	Checkweigher IP address	-	Valid IP address
NeedDeviceFormat	Use of line format in case of checkmark	☑	Checkbox
port	XML port for communication	55100	Numeric
vncEnable	With HC checkweigher always off, with HC Avantgarde checkweigher always on	-	Checkbox
vncPassword	Password for HC Avantgarde checkweigher	-	Alphanumeric
vncPort	Standard port for VNC connection	5900	Numeric
showDeviceFrame	Activates/deactivates the display of the device in the menu "overview".	☑	Checkbox

6.2.12 UPS

The UPS is editable under `System Settings > Edit device settings > (Select <UPS tab>)`. At the tab menu on the top you can switch between the screens.

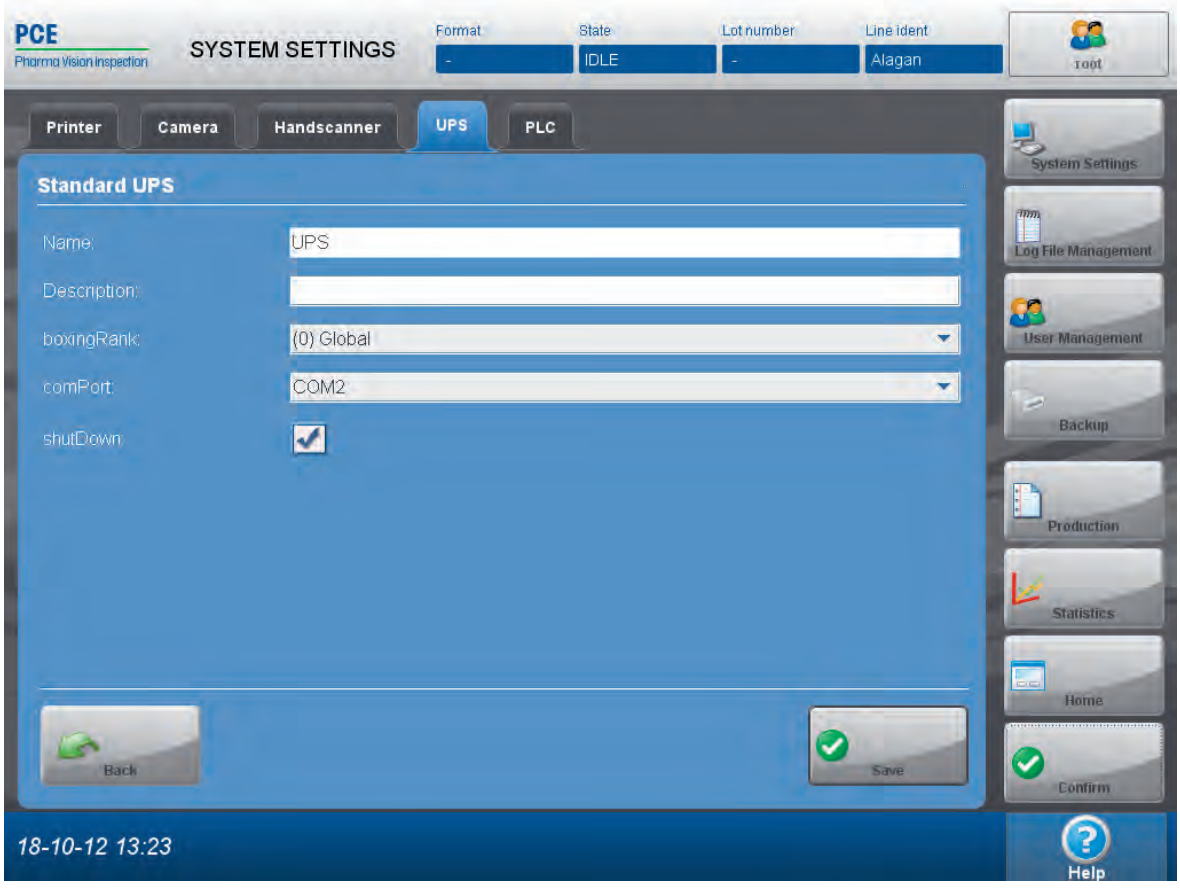


Figure: `System Settings > Edit device settings > (Select <UPS tab>)`

Edit the settings at the input fields and scroll down menus. The table below gives an overview of these functions:

Parameter	**Description**	**Default value**	**Allowed values**
Name	Name that has been assigned in the device management settings	-	Alphanumeric
Description	Optional description	-	Alphanumeric
boxing Rank	Hierarchy level (rank)	(0) Global	Drop-down list

comPort	Describes the COM Port the device is connected to. (COM1 … COM30/USB)	-	Drop-down list
shutDown	Determines whether the PC needs to be shut down in case of power failure.	☑	Checkbox
showDeviceFrame	Activates/deactivates the display of the device in the menu "overview".	☑	Checkbox

6.2.13 Comparator VGL7/VGL8

The UPS is editable under `System Settings > Edit device settings > (select <Comparator VGL7/VGL8> tab)`. At the tab menu on the top you can switch between the screens.

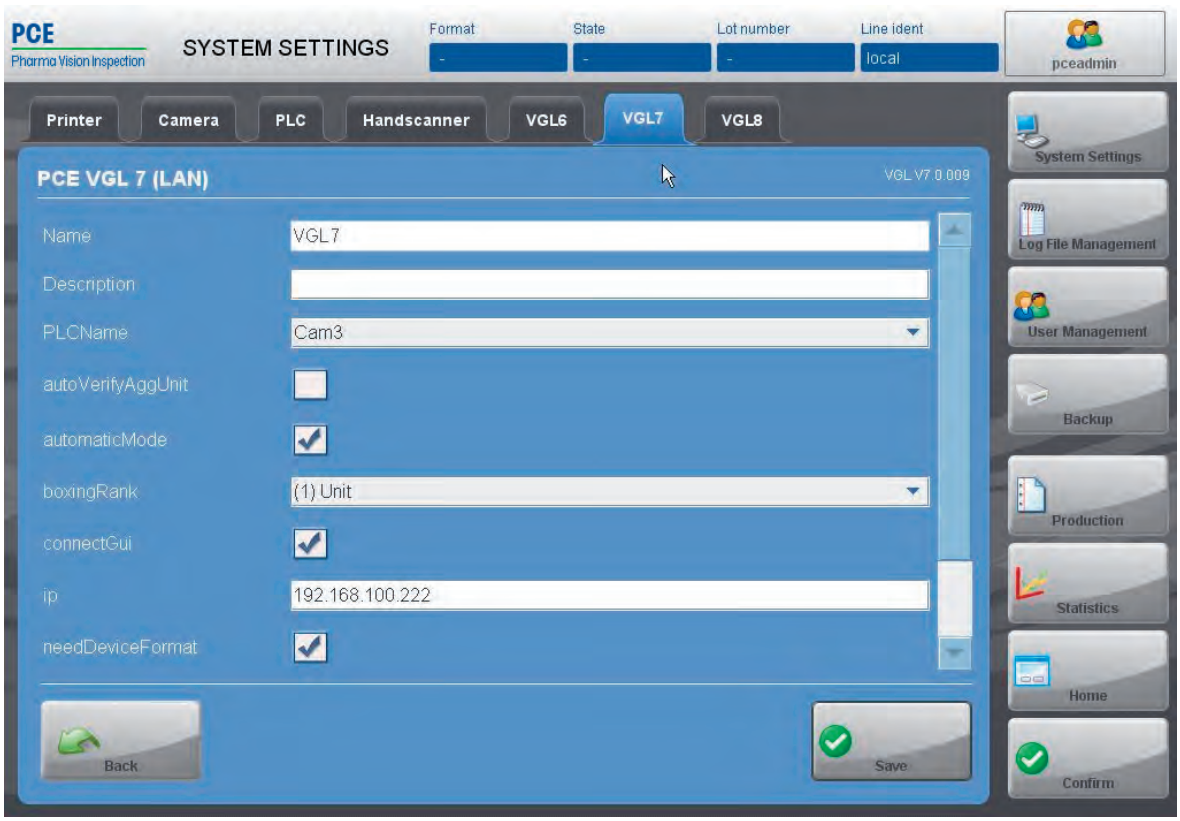


Figure: `System Settings > Edit device settings > (select Comparator VGL7/VGL8 tab)`

Edit the settings at the input fields and scroll down menus. The table below gives an overview of these functions:

Parameter	Description	Default value	Allowed values
Description	Optional description	-	Alphanumeric
PLCName	Name of comparator for the PLC	-	Drop-down list
autoVerifyAggUnit	Possibility of combining with one reading process the verification and commission into the database.	☐	Checkbox
automaticMode	When automatic mode is active, manual operation of the device is not possible.	☑	Checkbox
boxingRank	Hierarchy level	(1) Unit	Drop-down list
connectGui	Connection between Pilot Line Manager and comparer	☑	Checkbox
ip	IP address stored in comparator	-	Valid IP address
needDeviceFormat	Determines whether the device is jointly used in the line format.	☑	Checkbox

readerMode	PRINT_INSPECTION AGGREGATE_READER LINKING_READER AGG_INSPECTION LINEFORMAT See "Smart Camera"	PRINT_INSPECTION	Drop-down list
useWildcards	Possibility of using Wildcards at input of reference codes.	☐	Checkbox
showDeviceFrame	Activates/deactivates the display of the device in the menu "overview".	☑	Checkbox

6.2.14 RFID

Here the RFID menu is shown.

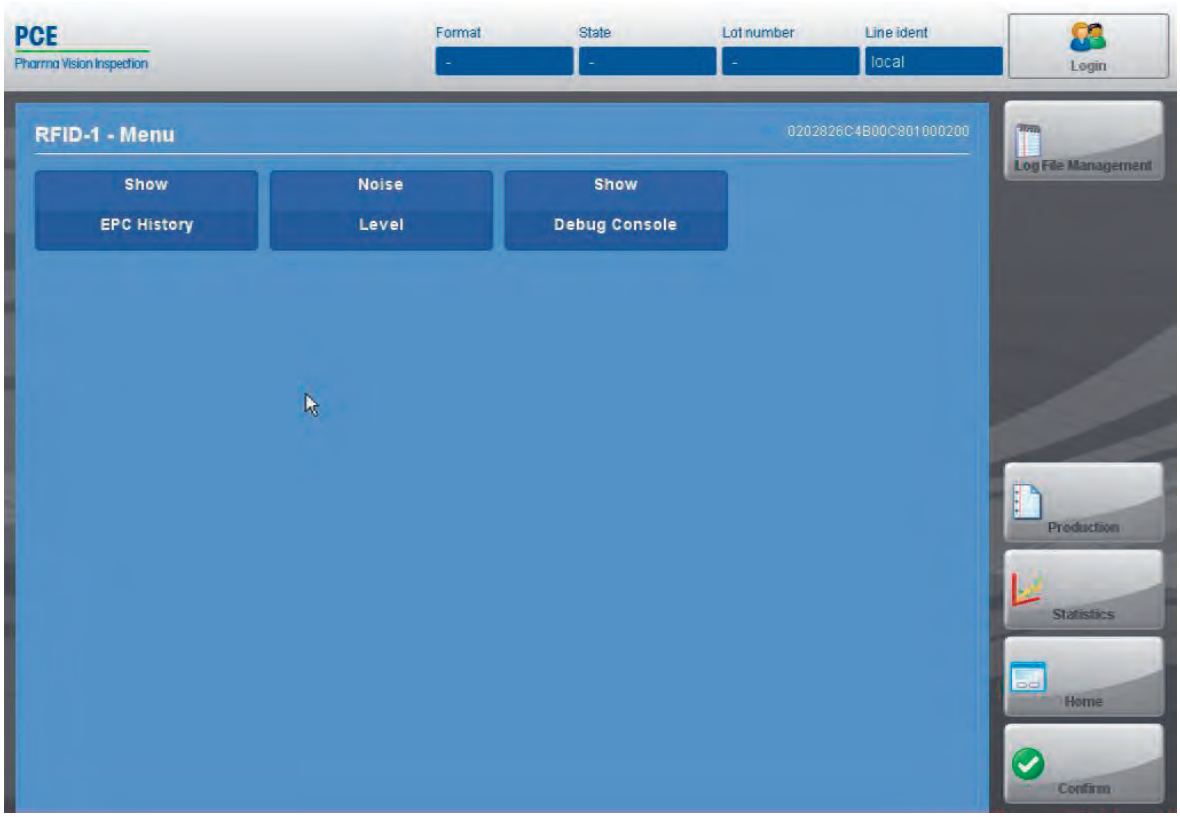


Figure: Home > RFID Reader

At the RFID menu you have the following options:

- Show EPC History: Shows the readings of the electronic program code (EPC).
- Noise Level: Shows the noise level of the RFID reader.
- Show Debug Console: The debug console must be activated within the settings of the device. It should only be activated for debug reasons!

6.2.14.1 Show EPC History

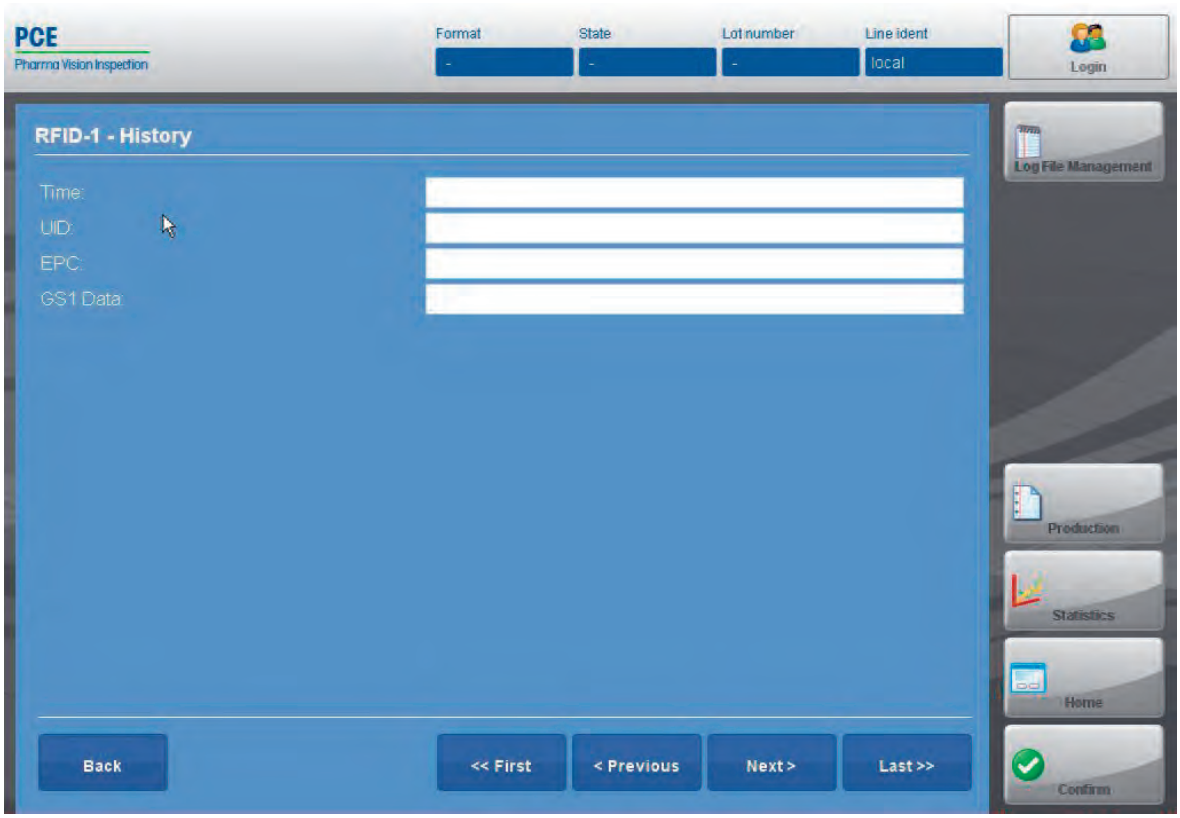


Figure: Home > RFID Reader > Show EPC History

- Time: Time of the scan
- UID: Serial number of the transponder
- EPC: Hexcode of serial number and GTIN
- GS1 Data: Read GS1 data - (01) GTIN; (21) Serial number

The last 1000 readings are stored.

6.2.14.2 Noise Level

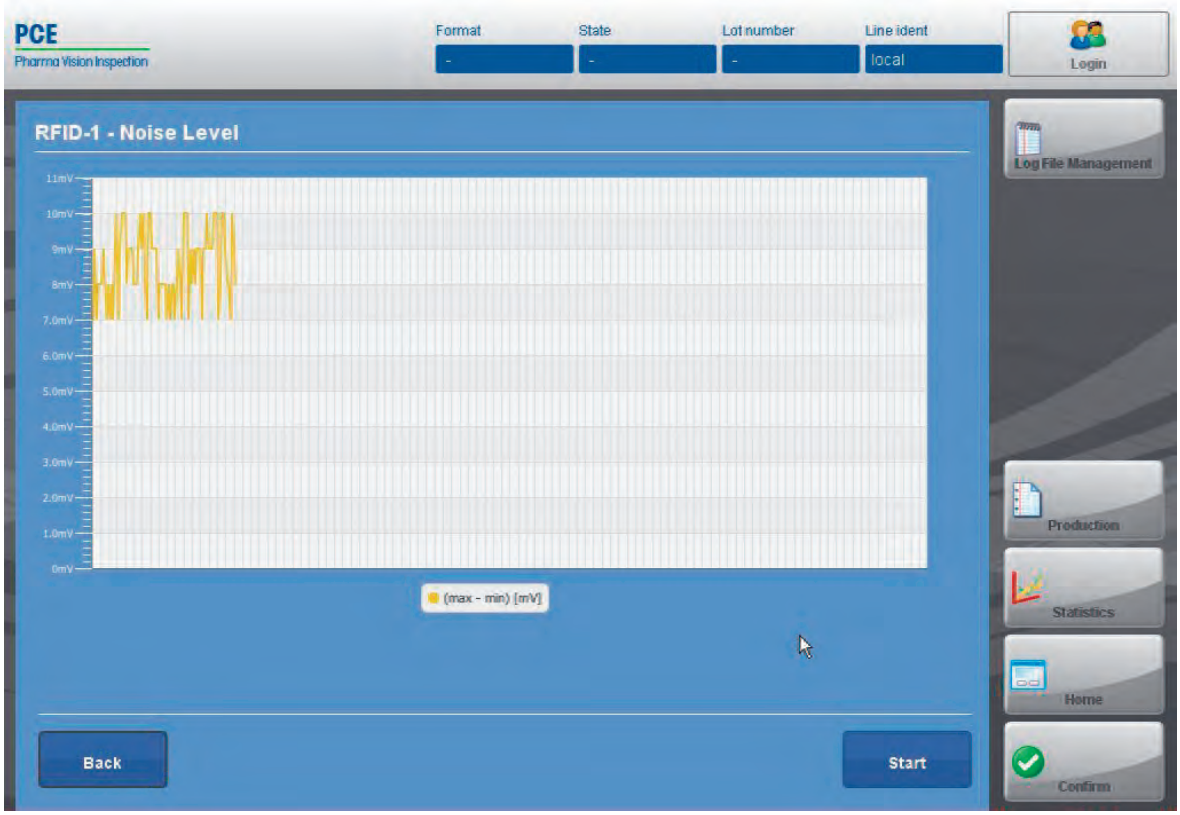


Figure: `Home > RFID Reader > Noise Level`

The menu helps positioning the antenna. The noise level for the Feig Reader should be within 1 … 20 mV.

- Start/Stop: Start/Stop of the recording.

6.2.14.3 Show Debug Console

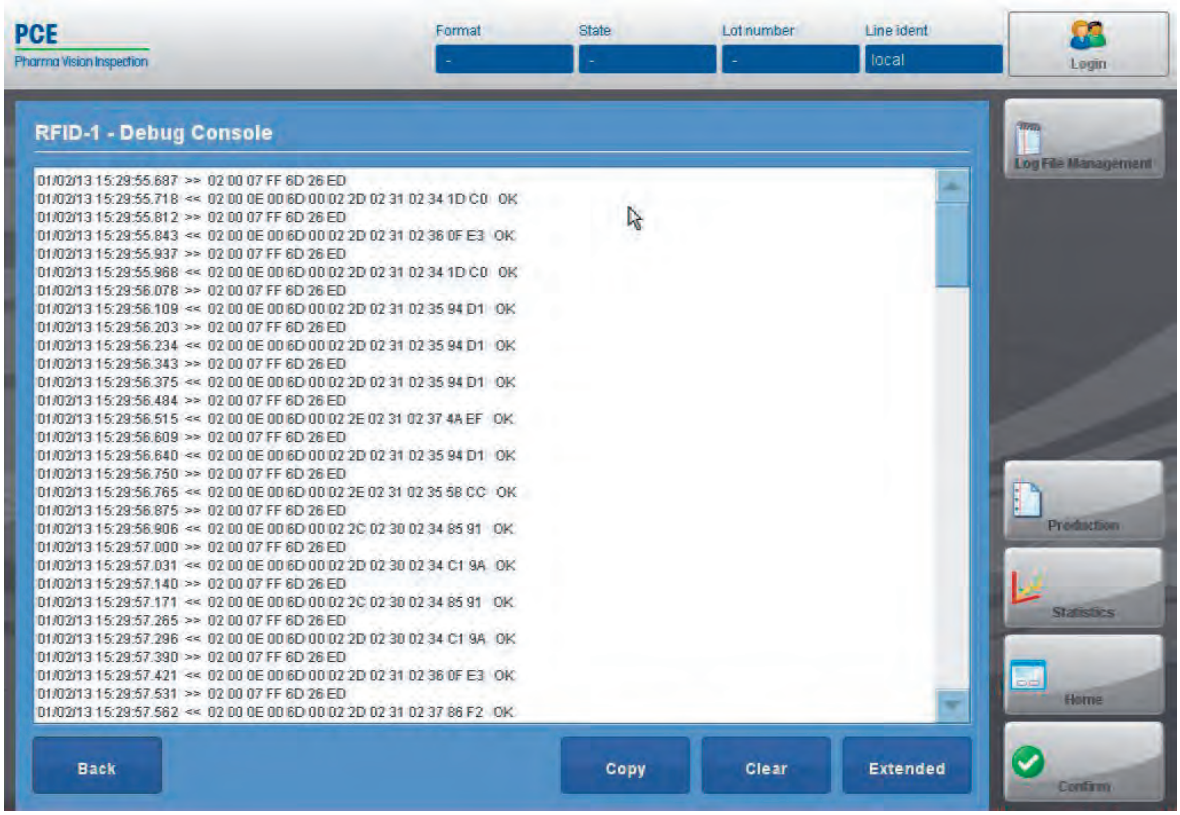


Figure: Home > RFID Reader > Debug Console

The menu shows the log file with all communication data. If you press the button Extended, the following menu will be displayed:

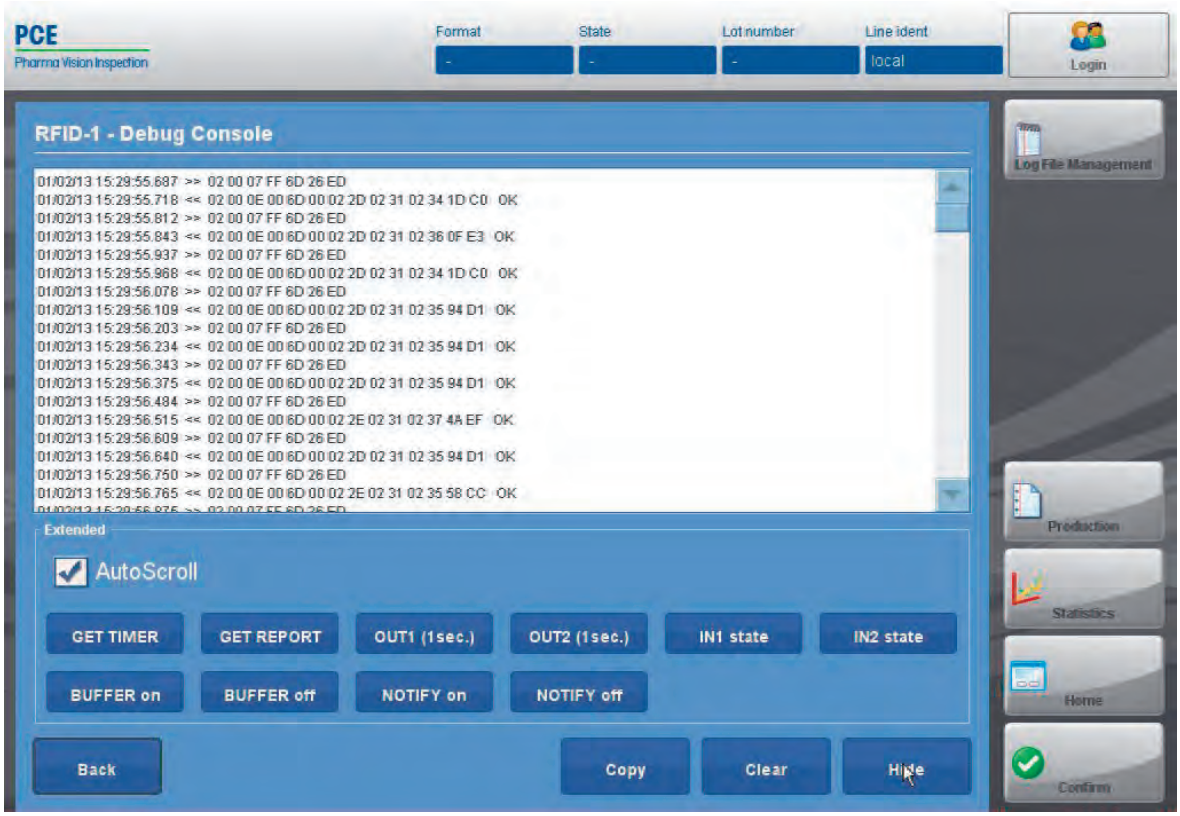


Figure: Home > RFID Reader > Debug Console > Extended

- Get Timer: System time of RFID reader.
- Get Report: Status report of RFID reader (for further information see documentation from Feig).
- Out 1 (1sec.): Hardware output 1 active for 1 second.
- Out2 (1sec.): Hardware output 2 active for 1 second.
- Int1 state: Show hardware input 1.
- Int2 state: Show hardware input 2.
- Buffer on: Activate buffer read modus.
- Buffer off: Deactivate buffer read modus.
- Notify on: Transmission of the read data without buffering on.
- Notify off: Transmission of the read data without buffering off.

6.3 Configuring IP Addresses

This chapter describes the allocation of IP addresses to stations and devices for communication between devices and the PLM. All operating systems (DMS, ABS, SCS, and MAS if available) need an own IP address at the line. Also all the following devices need an IP address:

- Printers
- Cameras
- Hand Scanner
- Checkweigher
- UPS
- Comparator VGL7/VGL8
- PLC
- Com Interfaces
- Servers

First you have to allocate the IP addresses at every operating system of the station PCs and afterwards you need to allocate the device IP addresses at the device settings at the PLM.

6.3.1 Allocating IP Addresses

To allocate the IP addresses at the pre-installed Windows XP OS take the following path: `Press Start > Setting Network Connections > extern (intern is used from pce for configuration) > Properties > (Select Internet Protocol [TCP/IP]) > Properties > Advanced > add`. At this dialog you can add additional IP Addresses.

We recommend allocating the IP addresses as described in the corresponding wiring diagram and described below. This convention helps recognizing the IP addresses immediately. The allocation works as described below.

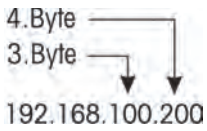
6.3.2 Device IP Ranges

For device IPs we recommend to use the following ranges at the 4.Byte:

- Cameras from 215…to 229
- Printers from 230…to 239
- COM servers from 240…to 249
- PLCs 250

6.3.3 Internal Remote Control

At a line the PCs of all stations are able to control one single PLM. The third byte at the DMS IP corresponds to the third IP bytes of the other stations. This allows controlling the PLM with all Interfaces at the line. For device IPs this works the same way.



6.3.4 Example of IP Allocation

The following example shows PCE's recommendation for allocating IP addresses:

a)

	XMV	ABS	SCS	MAS
PC	192.168.100.200	192.168.101.201	192.168.102.202	192.168.103.203
Camera1	192.168.100.215	192.168.101.215	192.168.102.215	192.168.103.215
Printer1	192.168.100.230	192.168.101.230	192.168.102.230	192.168.103.230
Camera2	192.168.100.216	192.168.101.216	192.168.102.216	192.168.103.216
PLC	192.168.100.250	192.168.101.250	192.168.102.250	-

b)

	XMV
PC	192.168.100.200
IP2	192.168.101.200
IP3	192.168.102.200
IP4	192.168.103.200

The DMS gets one IP for its PC and for the link to the devices of every additional station at the line it gets an additional IP address (b). The IP address of the DMS-PC matches at the third byte with those IP addresses of the other PCs. The IP addresses for the devices match at the third byte with those IP addresses of the devices from the other stations (a). The DMS also gets IP addresses for its devices (a).

6.3.5 COM Interface IPs

A special case regarding IP addresses are devices with Com-Port interfaces (e.g. RS232). These are connected via a com-server. All devices connected to a com-server use the same IP addresses and are distinguished only by their port. The IP-Address allocation or the port allocation respectively has to be done at the W&T Comport Redirector software. For more information about the software see the corresponding manual or the help within the program.

The following table shows an example of the COM-Ports allocation:

Device Type	Name	IP-Address	Port	Description
COM port (With one port)	COM10	192.168.102.240	8000	SCS-**HRC**
COM port (With three ports)	COM11	192.168.102.241	8000	SCS-Hand Scanner
	COM12	192.168.102.241	8100	(SCS free port)
	COM13	192.168.102.241	8200	(SCS free port)
COM port (With three ports)	COM14	192.168.103.240	8000	MAS-Hand Scanner
	COM15	192.168.103.240	8100	(MAS port)
	COM16	192.168.103.240	8200	MAS-Hand Scanner

We recommend starting COM-port names from 10 (COM10…).

6.3.6 Entering IP addresses at the Devices

After allocating the IPs at the PCs of the stations the IP addresses have to be entered at the `device settings` dialog.

7 Production (A-3.7)

From the `production` screen all settings concerning the production can be made. Also production itself is started and controlled from here.

Note

Create devices before editing production settings

Before editing the production settings all devices have to be created (See chapter 6.2 (page 34)).

7.1 Production Settings Screen

To open the `Production settings` screen press `Production` at the menu panel on the right hand side of the screen. The following screen appears:

Figure: `Production`

Depending on the respective user rights the following operations are available from here:

Name	Function
Start production via order	Choose an order and start the production
Test run via line format	Choose a line format and start a test run
Add/edit order	Add or edit an order
Add/edit line format	Add or edit a line format
Create/edit product	Create or edit a product
Order results create report	Create a report of order results
AI management	Enable/disable AI management data
Reset order status	Reset the status of an order
Move order to line	Move order to produce it at another line

7.2 Line Format (A-3.7.2)

The line format contains the settings for all used devices at a line. Here the fields and permitted values of each device are defined.

Before setting up a line format, ensure that:

- camera formats are created
- a print format is created

Please note: For **High Resolution Camera** a default format is used.

7.2.1 Line Format Setup Procedure

At the setup of a line format you have to perform the following steps:

Step	Action	Explanation
1	Add line format	See chapter 7.2.3 (page 84)
2	Edit line format	See chapter 7.2.4 (page 84)
3	Edit device settings at line format	See chapter 7.2.5 (page 86)

7.2.2 The Add/Edit Line Format Screen

To create or edit a line format press `Production > Add/Edit line format` to get to the `Add/Edit line format` screen. The screen looks as follows:

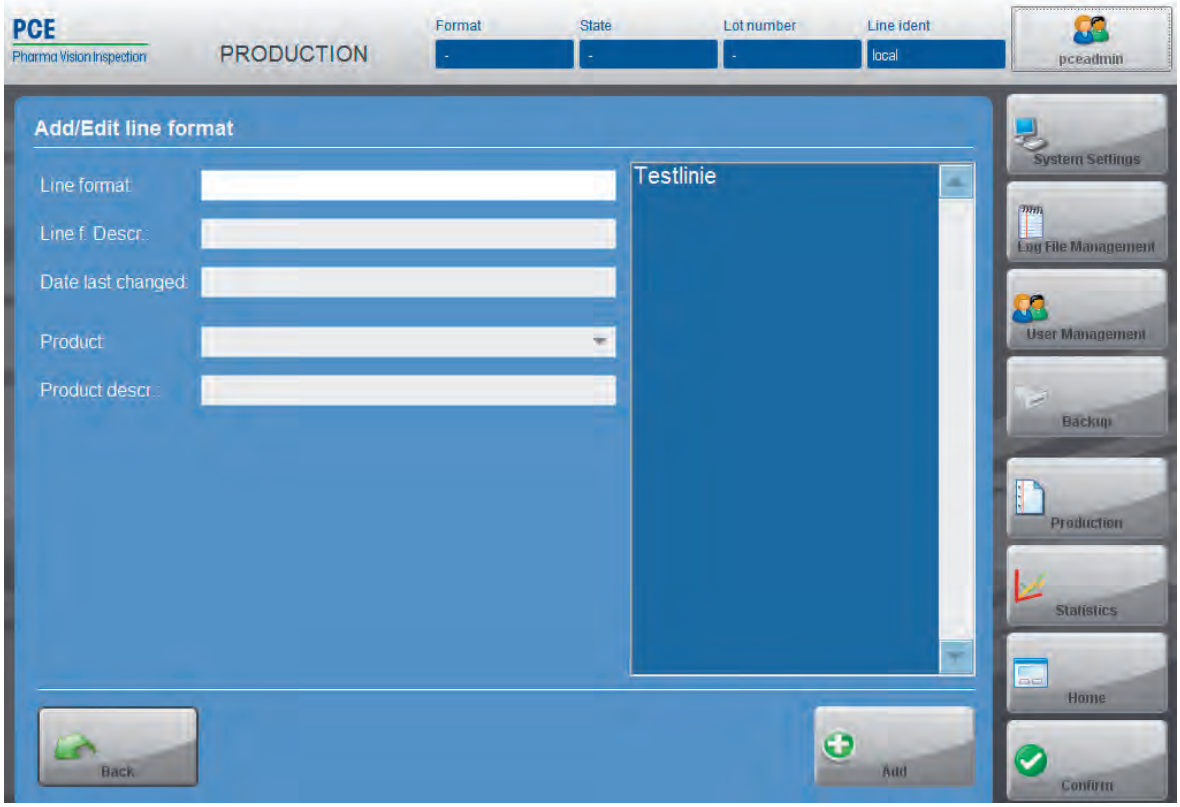


Figure: `Production > Add/Edit line format`

The list on the right hand side of the screen shows all existing line formats. Select a line format to view or modify it. Processing is possible only if the selected line format is not linked to a suspended order.

7.2.3 Creating a New Line Format

Press `Add` to create a new line format. The screen looks as follows:

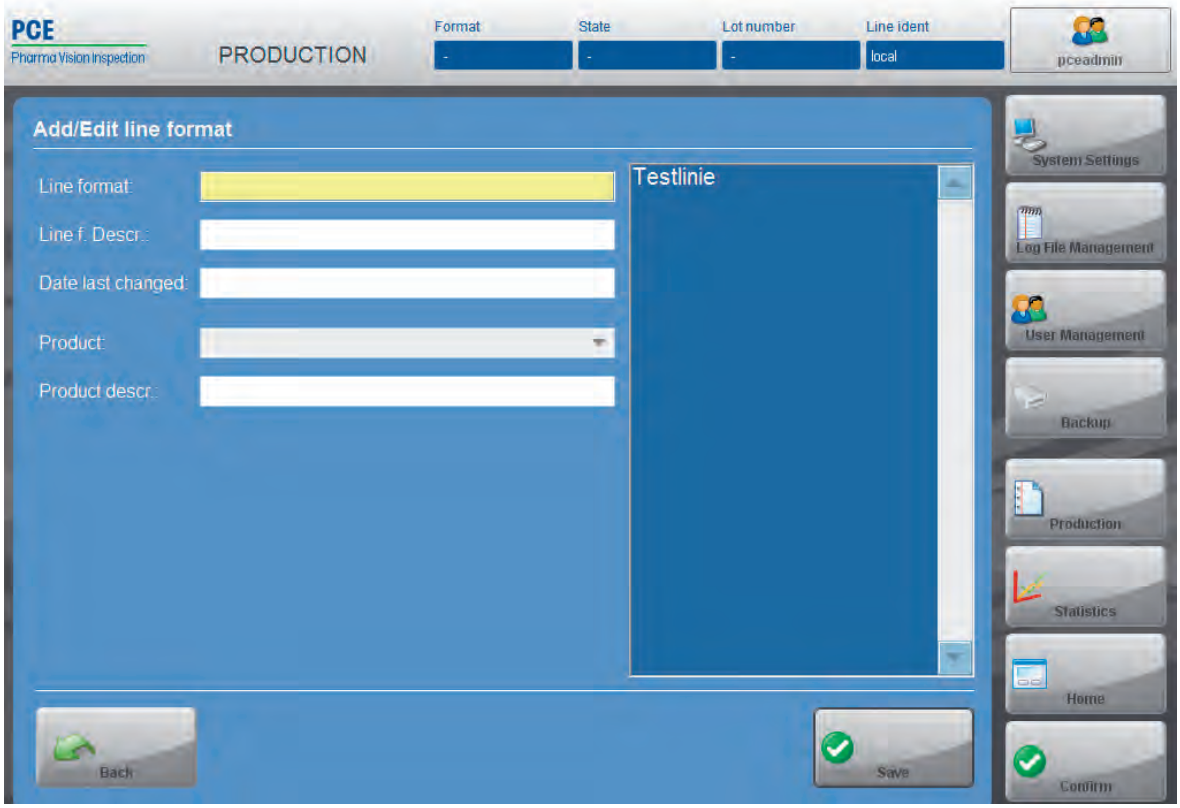


Figure: `Production > Add/Edit line format > Add`

Fill in a unique name for the new format and press save. Additional description is optional. To create the line format press `Save`.

You can also copy a line format and use its settings for a new line format. To copy, select the line format you want from the list and press the copy button (see screen in chapter 7.2.4 (page 84)), change the name and the settings and press `Save`.

At the `Add/Edit line format` screen you can edit the following fields:

Name	Function
Line format	Enter the name of the new line format
Line f. descr.	Here you can enter additional information about the line format
Date last changed	Shows the last date of change
Product	Select the corresponding product name
Product descr.	Additional information about the product

7.2.4 Editing Line Formats

To edit a line format press `Production > Add/Edit line format` to get to the `Add/Edit line format` screen. Select an existing line format from the list to edit. You can edit the line format information as described in chapter 7.2.3 (page 84). The screen looks as follows:

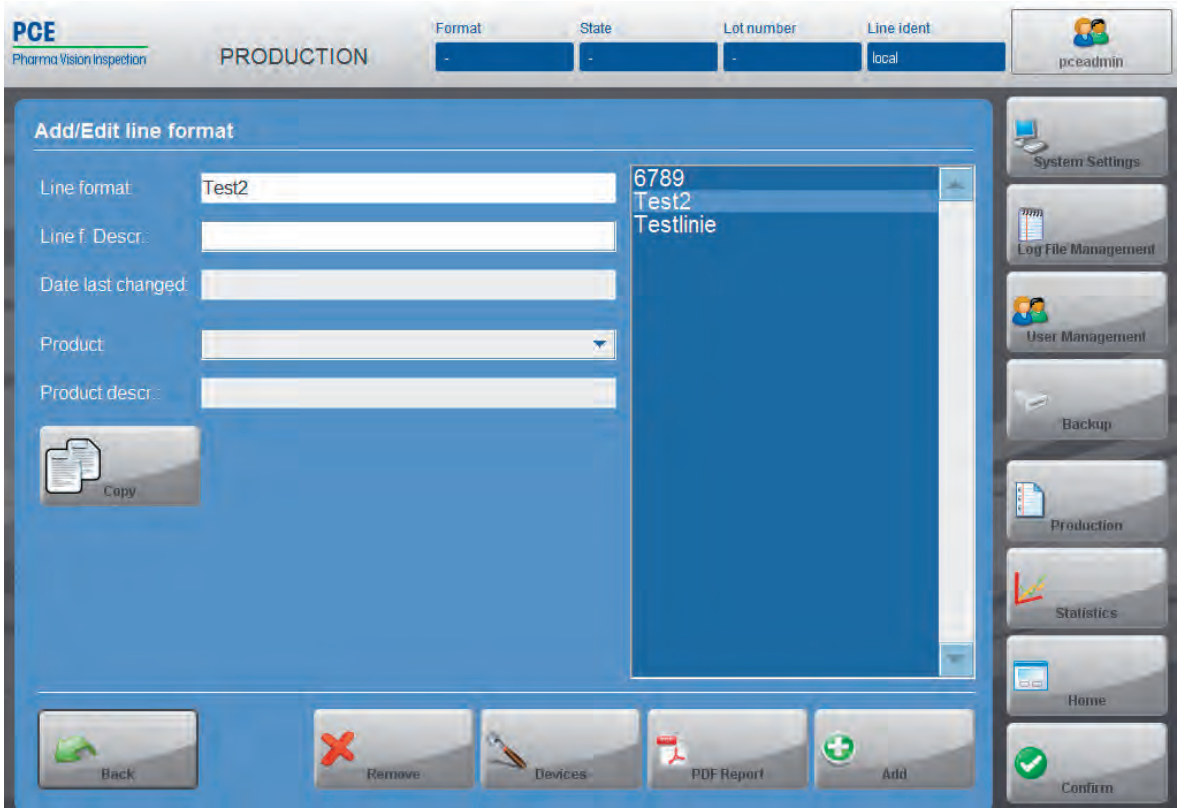


Figure: `Production > Add/Edit line format`

7.2.5 Editing Device Settings at Line Format (A-3.7.2.5)

At the line format you have to determine which fields/variables of a device have to be used at the line. The fields are defined by loading a device format. The parameters can be edited.

Note

Create devices before editing formats

Devices have to be created before you can set the formats (See chapter 6.2 (page 34)).

Some devices manage their formats by their own; this means editing the settings of these devices is not done at the line format. The path for changing the settings for these devices is as described in the following table:

Name	Function
HRC	At the monitor from the station where the **HRC** is installed switch from PLM to**HRC-AI Software** using the switch button.
SMC	At the PLM go to the `Home` screen and select the **SMC**.
PLC	Press `System settings > Edit device settings`

Devices that manage their formats by their own do not have the possibility to load the formats into the PLM but need to be activated (see below).

Note

Activate device

To use a device at a line format it is essential to set a checkmark at the "activated" check-box, put in a name for the device and set the variables.

Set a checkmark at the "activated" checkbox, enter a name for the device and set the variables. Select the wished line format from the list (see chapter 7.2.4 (page 84)) and press `Devices`. The following screen appears:

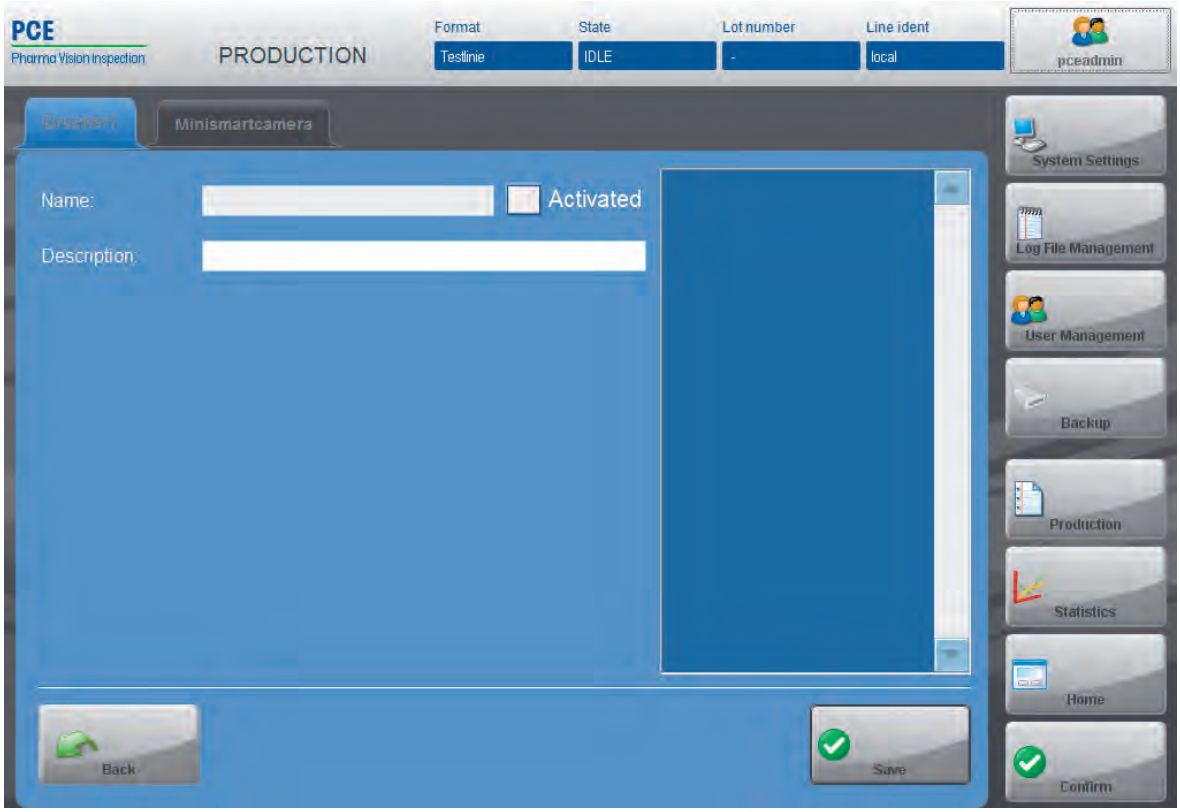


Figure: `Production > Add/Edit line format > Devices`

For every used device you have to perform the following steps (see also at the following screen):

Step	Description	Explanation
1	Select a device	From the tab menu on the upper frame of the screen. You see a tab for every previously created device.
2	Set a checkmark at the `Activated` checkbox.	If the checkmark is set, the device can be used in the line.
3	Press `load formats`	Loads the device formats stored on the cameras, printers and possibly other connected devices to the Pilot Line Manager.
4	Select the desired device format you want to use at the line format.	From the List.
5	Press `load fields` to load the preconfigured settings of the selected device format.	Possible parameters are retrieved from the selected formats. The types of codes (e.g. DMX, GTIN or CIP) are loaded into the left column. The formats of the Identification numbers respectively the value ranges of other variables are loaded into the right column. Type and number of displayed parameters depend on the camera settings.

The figure below shows the device settings at the line format of a Smart Camera:

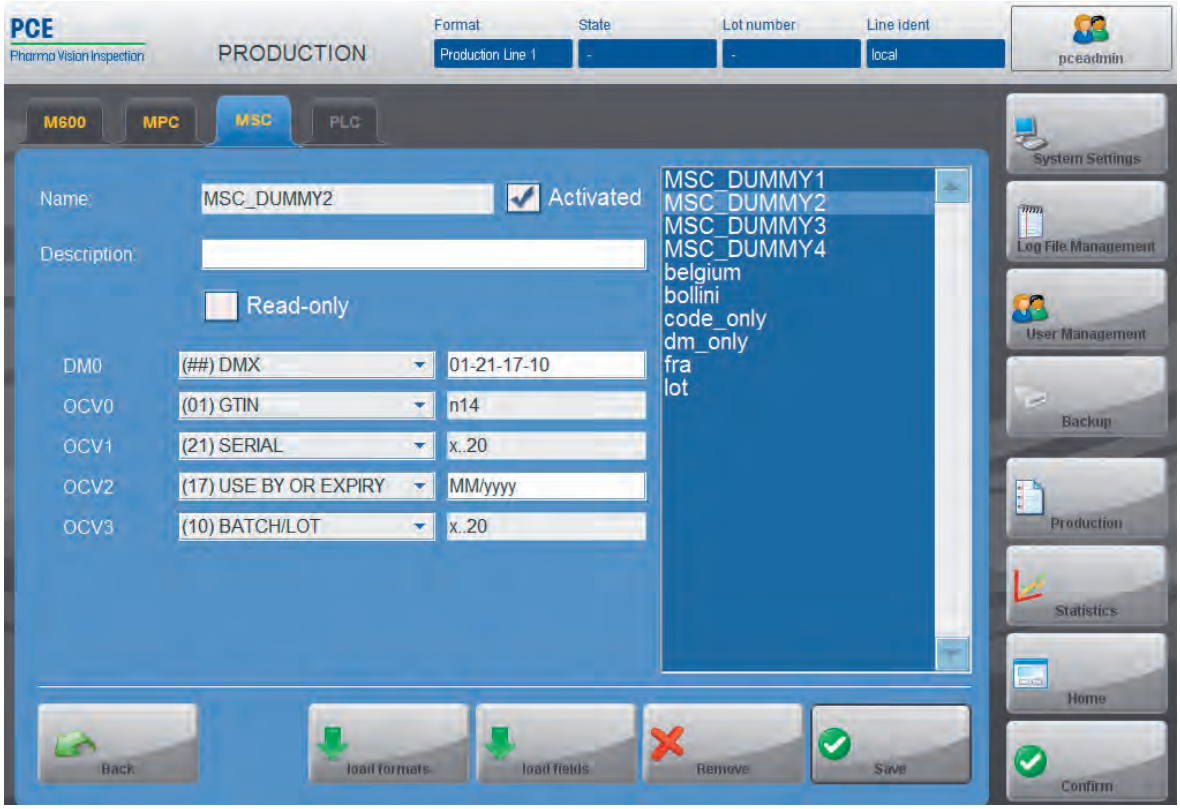


Figure: `Production > Add/Edit line format > Devices > Load formats`

'Read-only': This function is used, for example, if you have a batch of items that has already been printed. The production was stopped and now the items have to be further processed. The serial numbers do not yet exist at the database. Then the serial numbers only have to be read and saved into the database. For regular serialization this function is deactivated.

Parameter Prefixes

All parameters with ## (double hash) in front of it are for codes:

(##) DMX

(##BC) BARCODE 128

(##HR) HUMAN READABLE

(##RF) RFID EPC

At their fields you have to input the content the code has to contain. E.g.: At the field 'DM0' select (##DMX). Fill in the AIs separated by a hyphen. Example:

AIs to be embedded in the DMX code	**Fill into the DM0 field**
GTIN (01); SERIAL(21); USE BY OR EXPIRY(17); BATCH/LOT(10)	01-21-17-10

At the parameter fields in the left row you select the field content type. In the right row you define the field content format. The coding refers to the GS1 standard.

All parameters with X in front of it are wildcard fields for human readable text. Here you can input any text to print it onto the unit.

At the Description field you can add information about the special configuration of the device in this line format.

Note

Save the settings

After completion of the format settings press `Save`.

7.2.6 Device Settings at Line Format - PLC

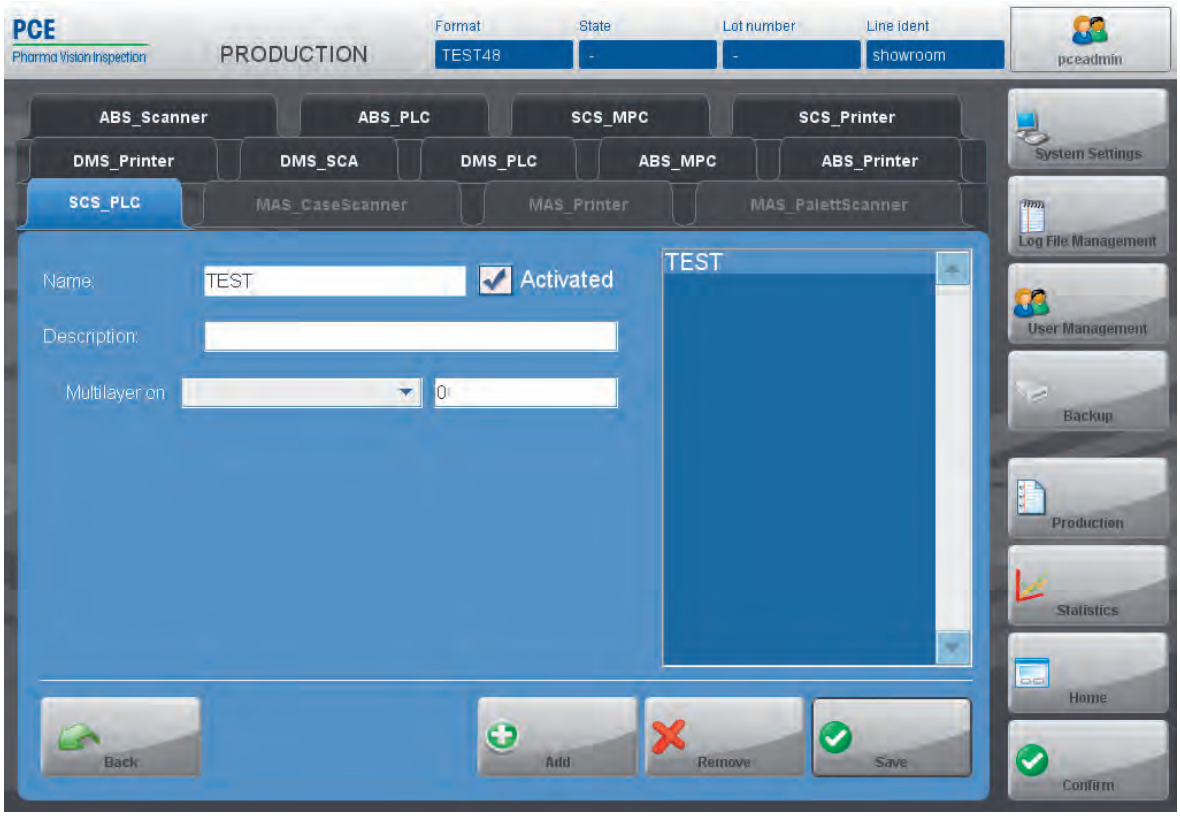


Figure: `Production > Add/Edit line format > Devices > (PLC tab)`

For the PLC there are no predefined device formats to load. The device format is created by typing the name of the device format into the field 'Name'.

Enter the name for the device format and press `Save`. The parameter fields appear. Now you can edit the settings of the PLC, afterwards press `Save`. Which parameter fields appear at the PLC tab is depending on the system settings of the PLC (See chapter 6.2.6).

Frequently used parameters are:

- Belt speed: Speed of the conveyor belt in m/min.
- Camera 1 Offset: Camera inspection area. Starting value: 0 mm
  Increase value: Adjustment of the inspection area in running direction
  Decrease value: Adjustment of the inspection area against the running direction
- Printer 1 Offset: Print area. Starting value: 0 mm
  Increase value: Adjustment of the inspection area in running direction
  Decrease value: Adjustment of the inspection area against the running direction
- Product Width: Product length of the side directed at the print head in mm.
- Product Width Tolerance: Allowed tolerance of the product length in mm.

7.2.7 Device Settings at Line Format - Smart Camera

The screen and the table below show the setting options for the Smart Camera at the line format. At the parameter settings the fields to be printed are defined.

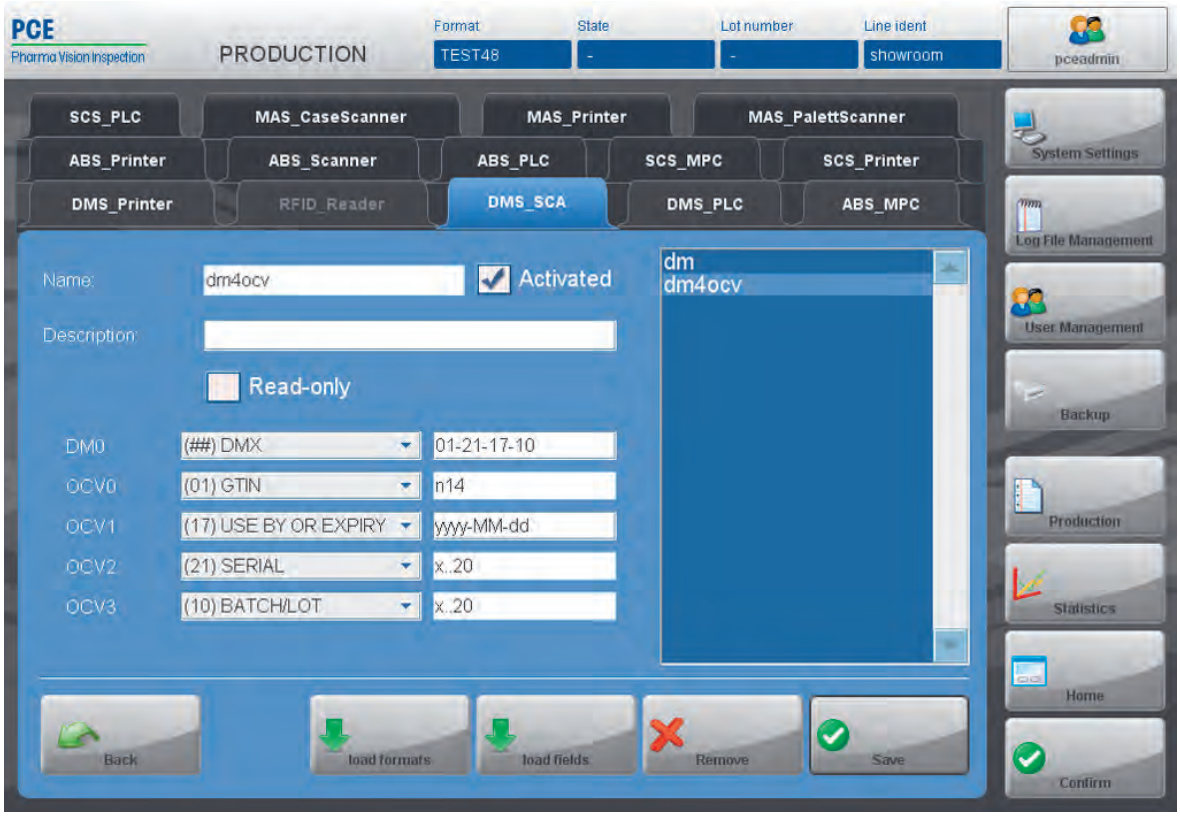


Figure: `Production > Add/Edit line format > Devices > (Smart Camera Tab)`

Execute the steps as described in chapter 7.2.5 (page 86). The parameters available depend on the selected preconfigured format. Frequently used parameters are:

Parameter	**Column 1**	**Column 2**
DMO	Type of the data matrix code	Formatting of the data matrix code
OCV	Type of the plain text verification	Formatting of the plain text verification
Code	Barcode type	Formatting of the barcode
Pix	Without meaning	Without meaning

7.2.8 Device Settings at Line Format - High Resolution Camera

The screen and the table below show the setting options for the **High Resolution Camera** at the line format.

Figure: `Production > Add/Edit line format > Devices > (Megapixel Camera Tab)`

Execute the steps as described in chapter 7.2.5 (page 86). The parameters available depend on the selected preconfigured format. Frequently used parameters are:

Parameter	**Column 1**	**Column 2**
ContentSize	Application Identifier 37, the number of units contained, automatically generated field in reader with rank>1	Number of boxes per bundle or carton
boxHeight	Without meaning	Box-length transverse to the conveying direction [mm]
boxWidth		Box length in the conveying direction [mm]
bundleHeight		Bundle length transverse to the conveying direction [mm]
bundleWidth		Bundle length in the conveying direction [mm]

7.2.9 Device Settings at Line Format - Comparator 7/8

The screen and the table below show the setting options for the Comparator 7/8 at the line format.

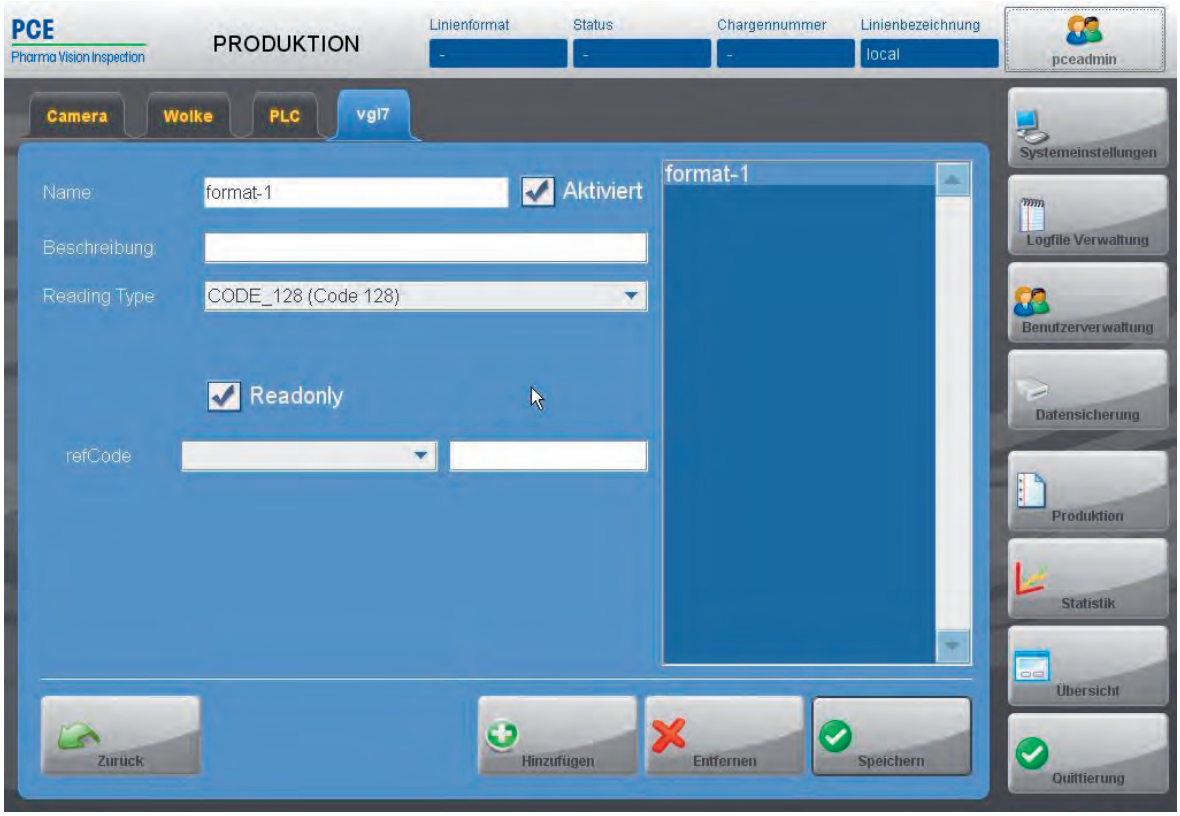


Figure: `Production > Add/Edit line format > Devices > (Comparator 7/8 Tab)`

Execute the steps as described in chapter 7.2.5 (page 86). The parameters available depend on the selected preconfigured format. Frequently used parameters are:

Parameter	**Meaning**
Reading type	Code type
refCode	Code type (Column 1) Code format (Column 2)

7.2.10 Device Settings at Line Format - Hand Scanner

The screen and the table below shows the setting options for the hand scanner at the line format.

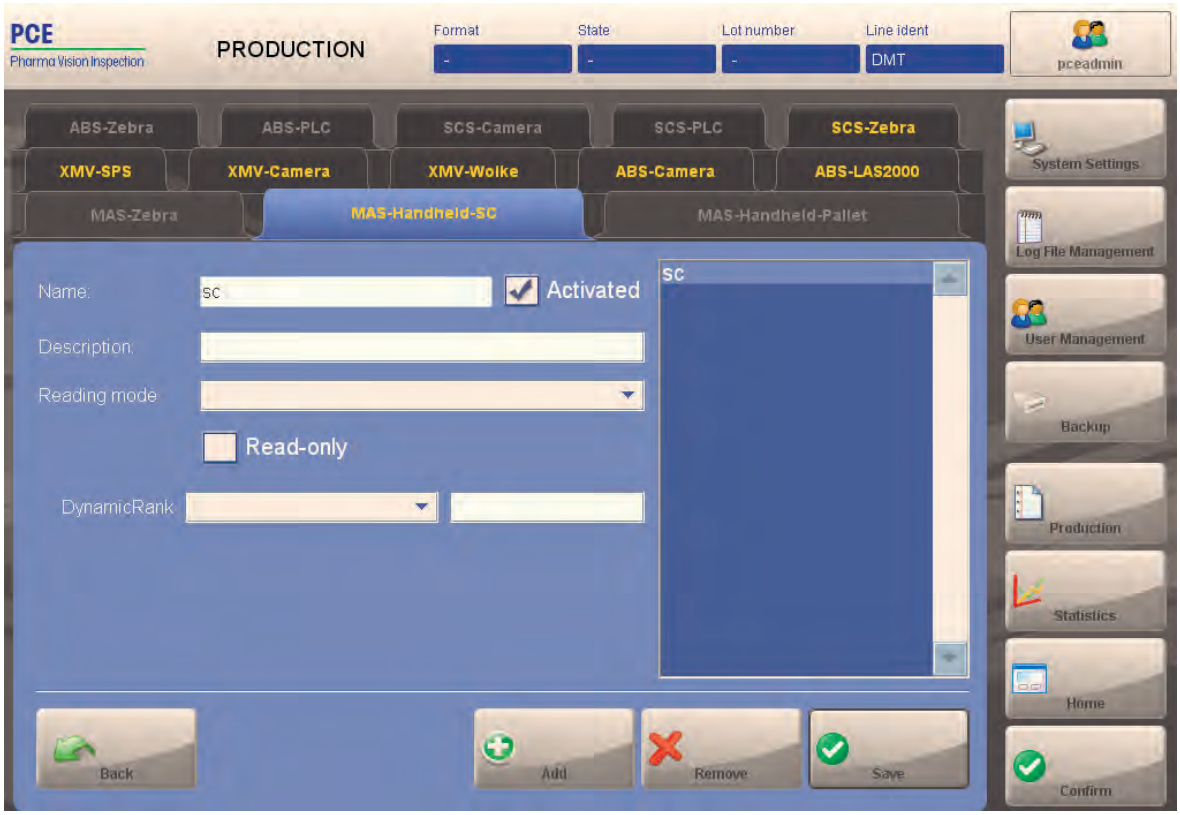


Figure: `Production > Add/Edit line format > Devices > (Hand Scanner Tab)`

Execute the steps as described in chapter 7.2.5 (page 86).

The following table describes the possible AI field selections:

Parameter	Meaning
Reading Mode	STREAM_MODE: The reader is on and reads every code in the reading range. TRIGGER_MODE: The hand scanner reads only after the trigger key has been actuated.
ContentSize	Application Identifier 37, the number of units contained, automatically generated field in reader with rank > 1

7.2.11 Device Settings at Line Format - Wolke Printer

The screen and the table below show the setting options for the Wolke Printer at the line format.

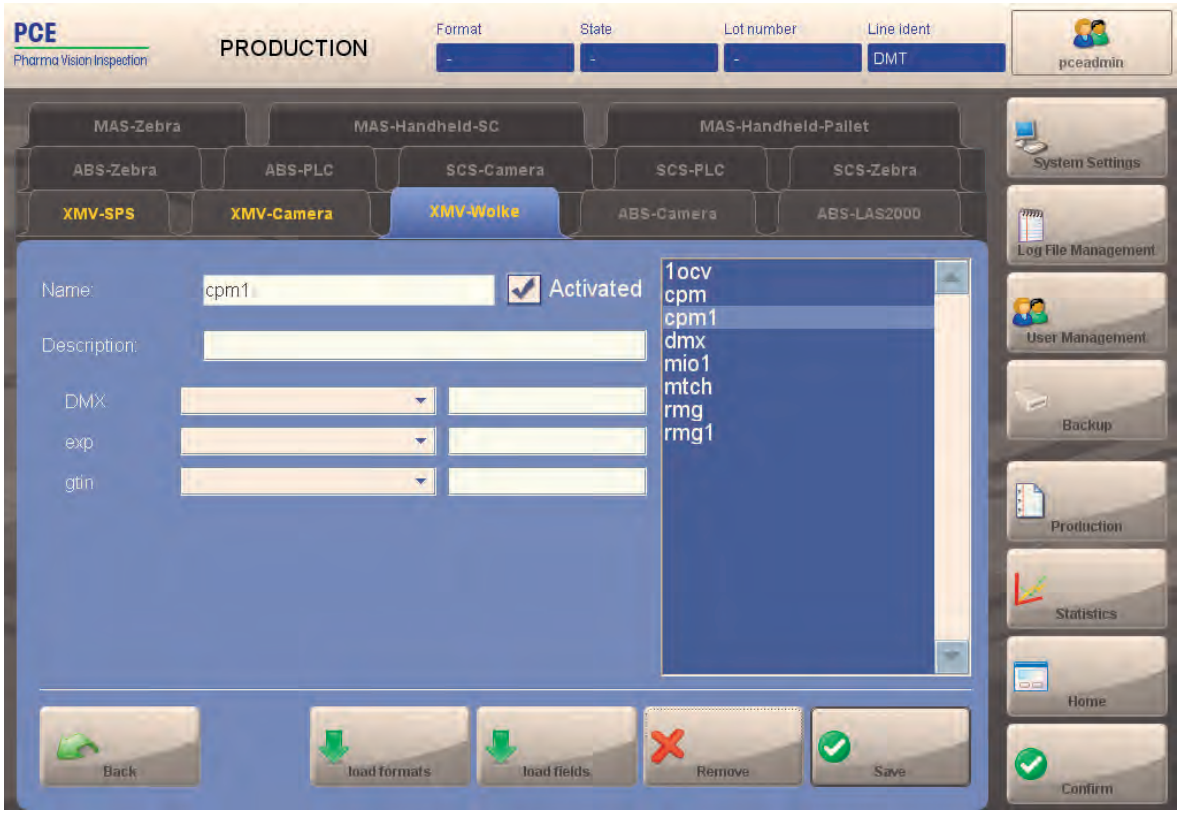


Figure: Production > Add/Edit line format > Devices > (Wolke Printer Tab)

Execute the steps as described in chapter 7.2.5 (page 86). The parameters available depend on the selected line format. Frequently used parameters are:

Parameter	Column 1	Column 2
DMX	Data matrix code type	Data matrix code
EXP	Expiry date type	Expiry date format
GTIN	GTIN number type	GTIN number format
LOT	Type Charge	Charge format
SN	Serial number type	Serial number format

7.2.12 Device Settings at Line Format - Zebra Printer

The screen and the table below show the setting options for the Zebra Printer at the line format.

Figure: `Production > Add/Edit line format > Devices > (Zebra Printer Tab)`

Execute the steps as described in chapter 7.2.5 (page 86). The parameters available depend on the selected preconfigured format. Frequently used parameters are:

Parameter (Fieldname defined at label)	Column 1	Column 2
FN	Field number type	Field number format

7.2.13 Line Format Report (A-3.7.2.11)

A line format report contains all settings of the line format including device settings. To create a line format report go to the `Add/Edit line format` screen (see chapter 7.2.4 (page 84)) and select an existing line format from the list to edit. Press `PDF Report` to generate a line format report.

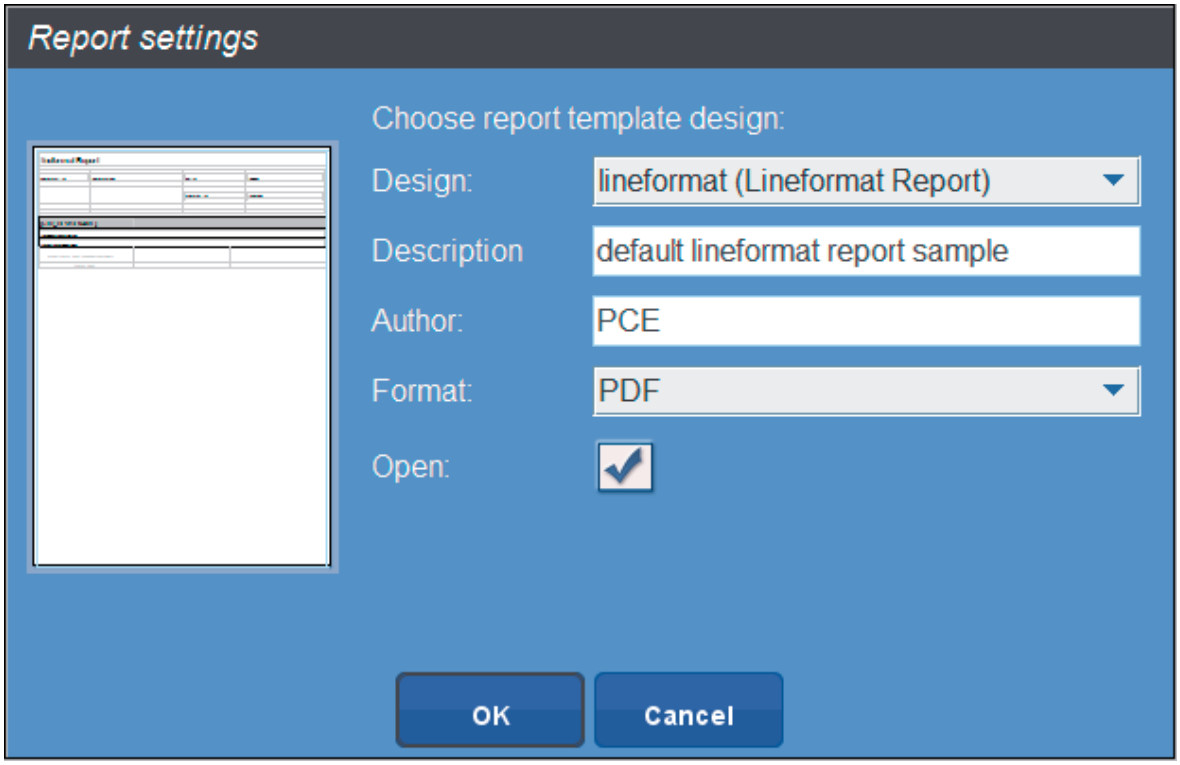


Figure: `Production > Add/Edit line format > PDF Report`

Choose a customized report template at the field 'Design'. Different output formats can be selected at the field 'Format'. This report contains all relevant data from the line format. The report is digitally signed and can be archived (customized) or be printed directly.

7.3 Product Management (A-3.7.3)

A product at the PLM is a set of information about a product that can be assigned to a line format or to an order e.g. GTIN, quantity, bundle size, case size, pallet size. The values of the product are then filled into the fields of the line format / order. The possibility to reuse the contents of variables avoids having to re-enter it at the creation of every order. The AI values are then transferred into the fields of the order. Creating a product is not essential but optional. The Product Management settings at the PLM are equivalent to the settings at the PSM. They use the same products and these can be created or edited at both systems.

7.3.1 The Product Management Screen

To get to the `product management` screen press `Production > Add/edit product.` The following screen appears:

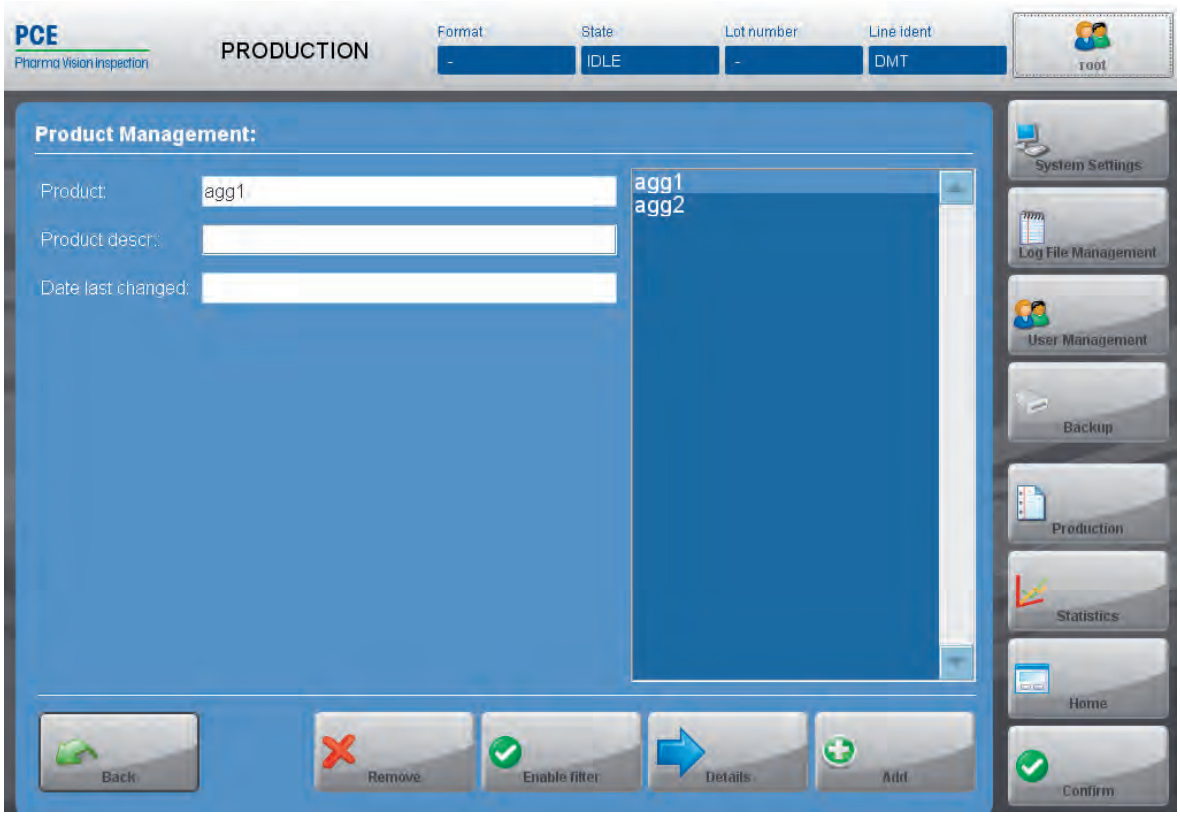


Figure: `Production > Add/edit product`

The list on the right hand side of the screen shows all existing products. Select a product to view or modify it.

With the buttons at the lower part of the screen you can call up the corresponding functions as described in the following chapters. The table below gives an overview of these functions:

Name	Function
Remove	Remove an existing product
Enable Filter	Use search filter to filter by product name
Details	Set the product specific content of values to be read by the camera
Add	Create a new product

7.3.2 Creating and Deleting a Product

To create a product at the `product management` screen (see chapter 7.3.1 (page 96)) press `Add` and type in a product name at the field 'Product' and press `Save`. You can add a description of the product at the field 'Product descr.'. Confirm by pressing `Save`. To delete a product press `Remove` instead of `Add`.

7.3.3 Adding and Deleting Application IDs at a Product

To add or delete Application IDs at a product go to the `product management`screen (see chapter 7.3.1 (page 96)) and select a product from the list. Press `Details`. The following screen appears:

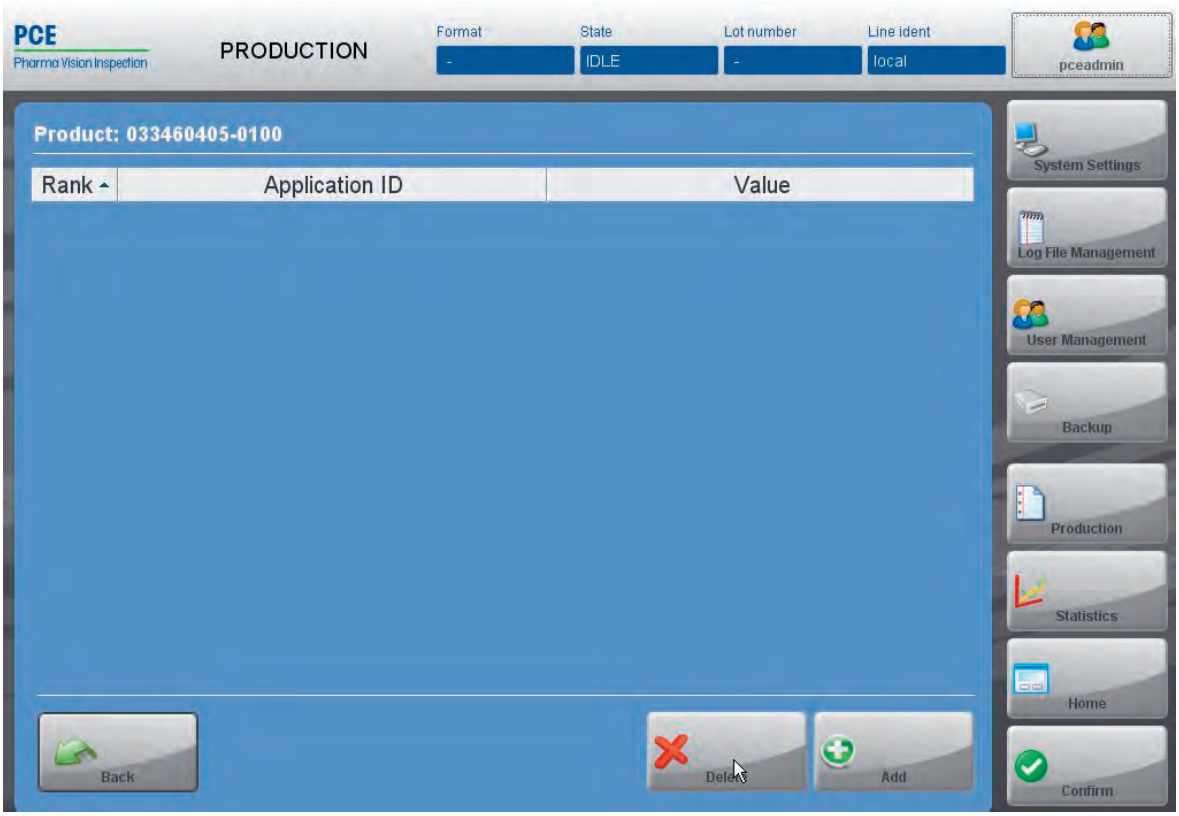


Figure: Production > Add/edit product > (select product) Details

At this screen you see all application IDs that are defined at the product (if applicable).

Press Add to define a new ID to the product. The following dialog appears:

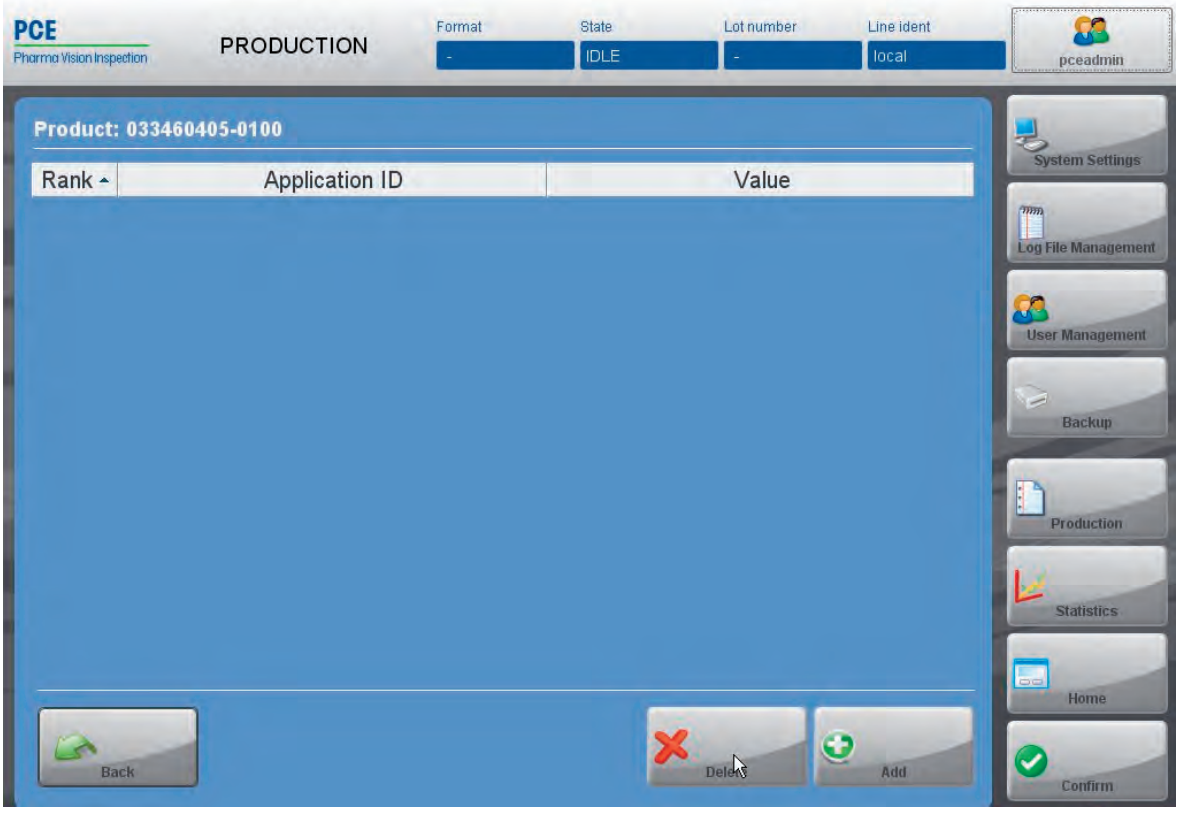


Figure: Figure: Production > Add/edit product > (select product) Details > Add

Now you can define a new product field. For the product field you can define the following values:

Field	Explanation	In this example
'Rank'	Here you define for which rank the field is valid. 0 = Global -> applicable for all Ranks 1-4 = Unit, Bundle, Case, Pallet 5-x = Additional ranks -> line specific	Rank1: DMS
'App. ID'	Here you define of which ID type the field is.	GTIN
'Format'	Here you define which format the ID has.	GTIN is always a 14 digit number

Press `OK` to create the new product field. At the following screen that appears you can choose the created Application ID and edit the value of the ID. (In this example this is the GTIN that has to be entered into the 'Value' field).

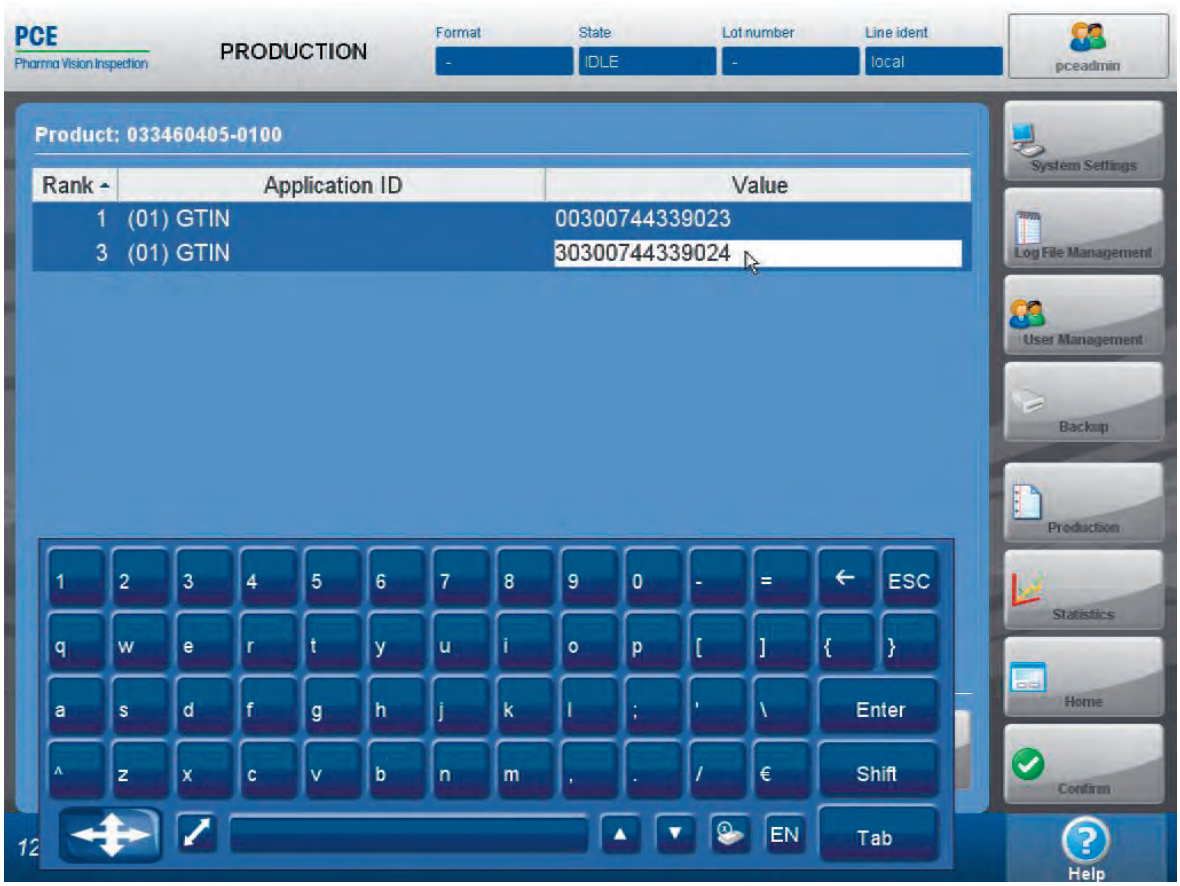


Figure: `Production > Add/edit Product > (select product) Details > Add > Ok`

7.4 Order Management (A-3.7.4)

An order at the PLM contains information about the order and the AI values are assigned.

7.4.1 Loading an Order via Hand Scanner

If you want to reuse an existing order you can filter for that order by scanning the corresponding barcode. Activate the search filter by pressing `Enable filter`. Set the curser into the 'search' field. Then you have the following possibilities:

- Scan any previously produced barcode of the order
- Scan a code that contains the order number. This code can be created online via an ordinary code creator website

7.4.2 Adding and Editing Orders

To make an order usable you have to assign a line format to the order. If you have assigned a line format to an order, the order uses the settings of the line format.

Selection of a Product

You can additionally select a product. If you select a product at the order management screen, the AI settings from the line format will be overwritten and used at the order but not saved to the line format. Only select a product if you want to use the device settings of a line format in combination with an order that is not assigned to the line. This could make sense if you do not wish to save another line format.

To add or edit a new order press `Production > Add/Edit order.` The following screen appears:

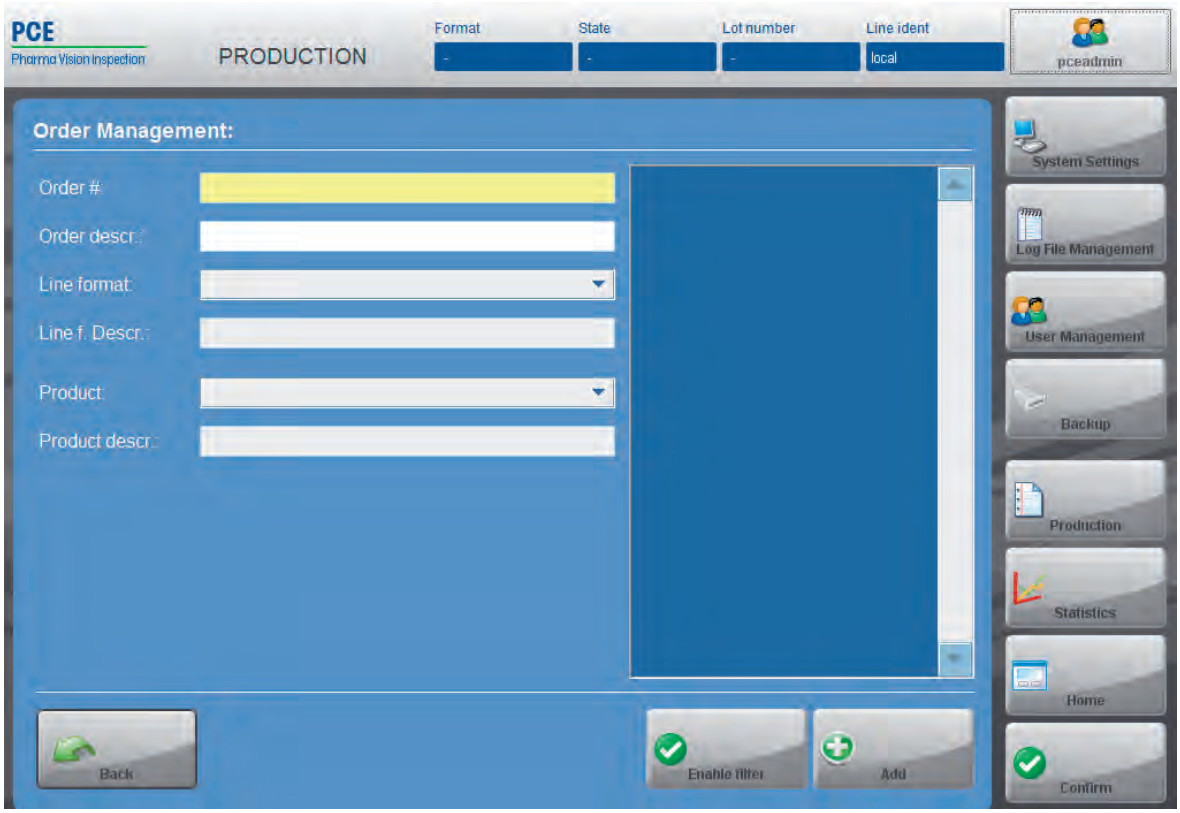


Figure: `Production > Add/Edit Order`

The list on the right hand side of the screen shows all orders that are still open and not yet concluded.

7.4.3 Adding a New Order

To produce an order it has to be "created in the PLM". Press `Production > Add/Edit order.` If there are orders that have not yet been assigned, these are shown in the list on the right hand site of the screen. Select one of them to use it.

If you want to create a new order press `Add`, write the number into the ' Order#' field and confirm with `OK`. The new order is now created. To edit settings for the order see chapter 7.4.4 (page 100).

Note

Existing production data can be reused

Duplicates will not be accepted by the system. However, for ease of use, the production data of an already existing, not yet executed order can be taken over by entering data manually.

7.4.4 Editing an Order

To edit an order press `Production > Add/Edit Order`.At this screen (see figure below) you can select an order from the list and change its settings. You can filter the entries by activating the search filter. Activate the search filter by pressing `Enable filter.` Now type in the number of the order you are searching. To

disable the filter, press `Disable filter`. Edit the settings at the input fields and at the scroll down menus. After you have changed any settings, the `OK` button appears. Confirm the new settings by pressing `OK`.

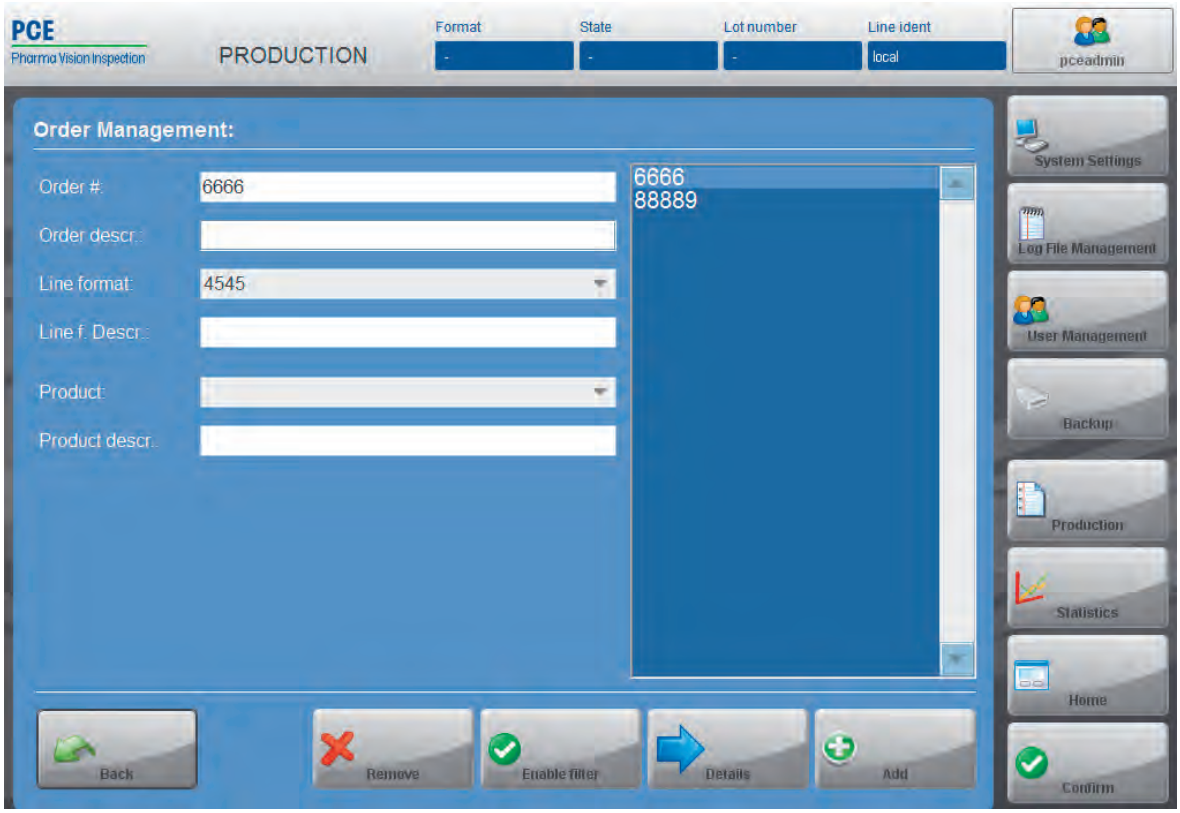


Figure: `Production > Add/Edit Order`

At the `Order Management` screen you can edit the following fields:

Name	Function
Order #	Here you have to enter the number of the order
Order descr.	Here you can enter additional information about the order e.g. special settings
Line format	Here you have to select the corresponding line format
Line f. descr.	Here you can enter additional information about the line format
Product:	Here you have to select the corresponding product name
Product descr.	Here you can enter additional information about the product

Before you can start the order, you have to add order details (see chapter 7.4.5 (page 101)).

7.4.5 Adding Order Details

To add order details manually press `Production > Add/Edit order`. Select an order and press `Details`. The Following screen appears:

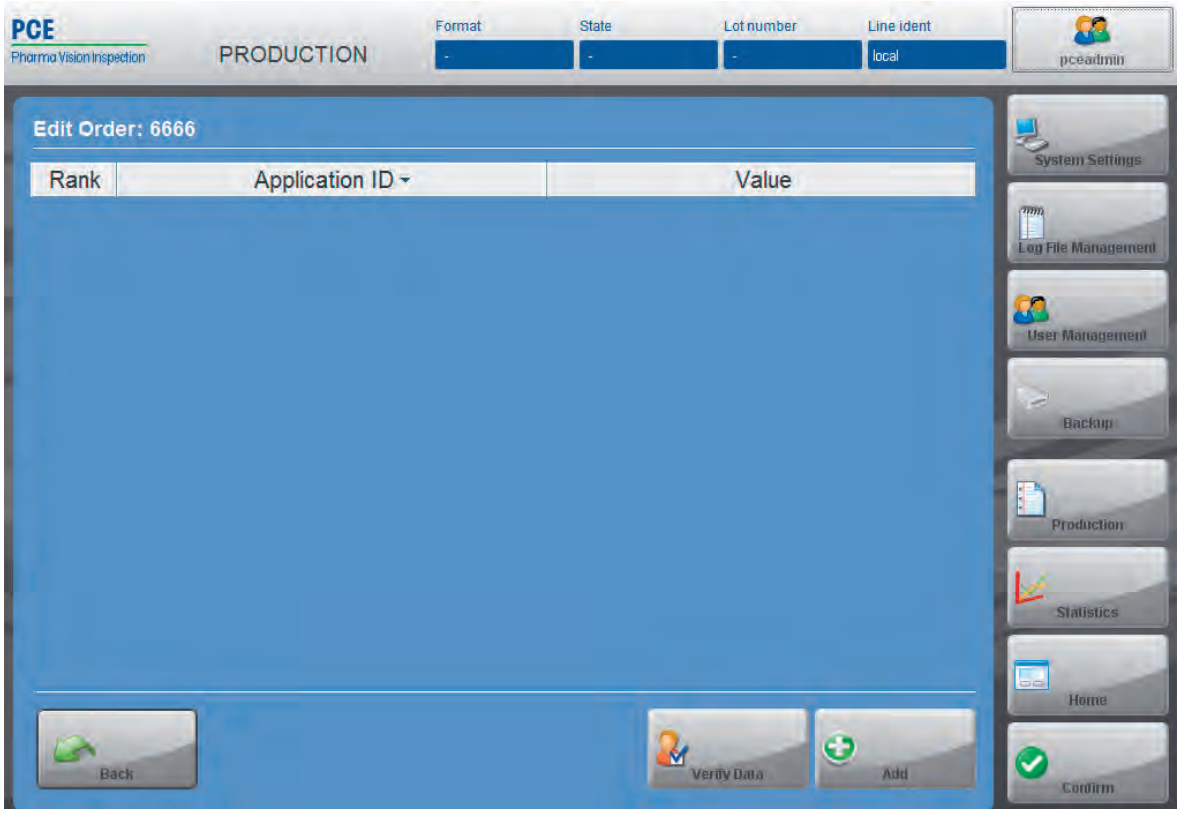


Figure: `Production > Add/Edit Order > Details`

Depending on the device settings used in the line format you can edit the corresponding fields. To add a field press `Add`. You can check all inputs for plausibility by pressing `Verify Data`. After editing confirm with `OK`. Necessary inputs will be checked for plausibility.

To input details via hand scanner see chapter 7.4.4 (page 100).

7.4.6 Deleting an Order

To delete an order go to the Order Management screen and select an order (see chapter 7.4.4 (page 100)). Press `Remove` and confirm with the `OK`.

7.4.7 Creating an Order Report (A-3.7.4.6)

To create an order report, go to the `Production Settings` screen (see chapter 7.1 (page 83)) and press `Order results create report` in order to get to the `Order Report` screen. Select an existing line format from the list to edit. Press `PDF Report` to generate a line format report in the selected format. The following window appears:

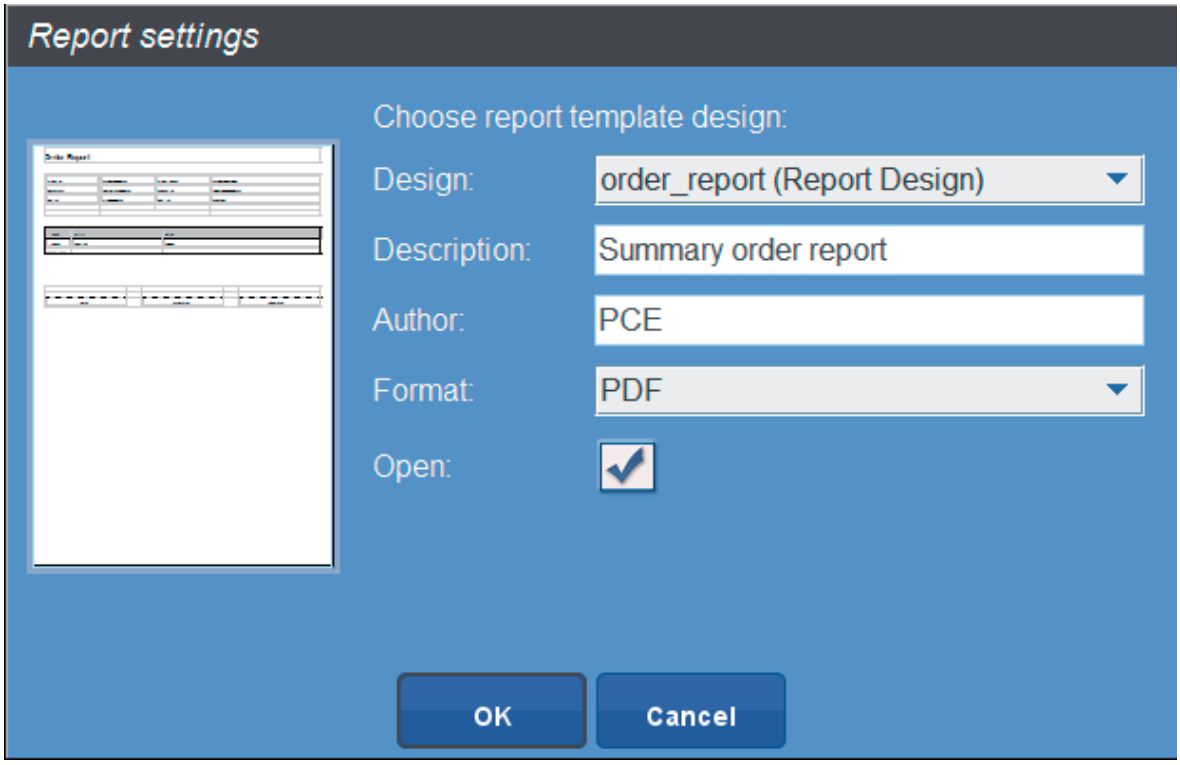


Figure: `Production > Order results create report > (Select order) > PDF Report`

Select a customized report template at the field 'Design'. Different output formats can be selected at the field 'Format'. This report contains all relevant data from the order as well as a list with log file entries during the respective production run. The report is digitally signed and can be archived (customized) or be printed directly. An order report can only be created when the order is finished.

Note

Storage of order data

- Upon completion of production the data of the order will be stored automatically on the server. This allows creating a report at a later point in time.
- All PDF reports generated will be stored on the path specified in the system settings.

7.4.8 Resetting the Order Status

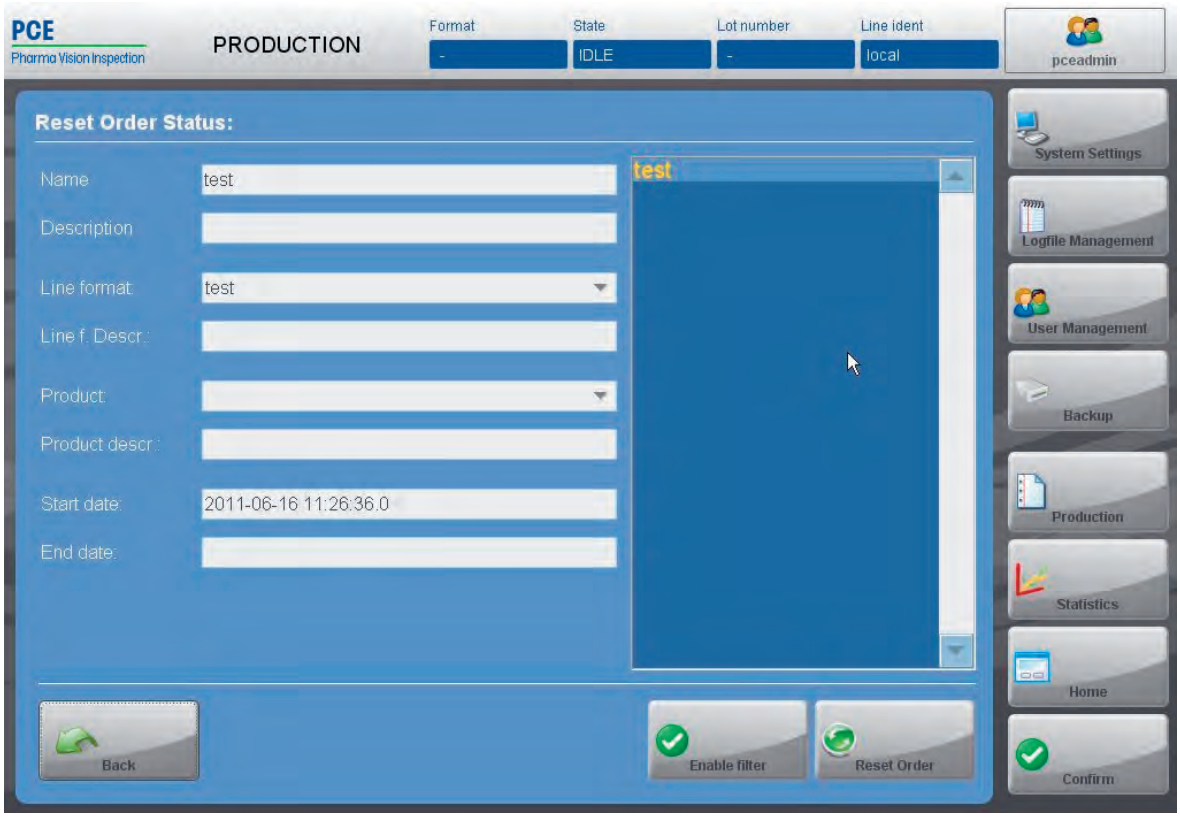


Figure: `Production > Reset Order Status`

Pressing `Reset Order` will reset a completed order to the status "Order created".

7.4.9 Move Order to Line

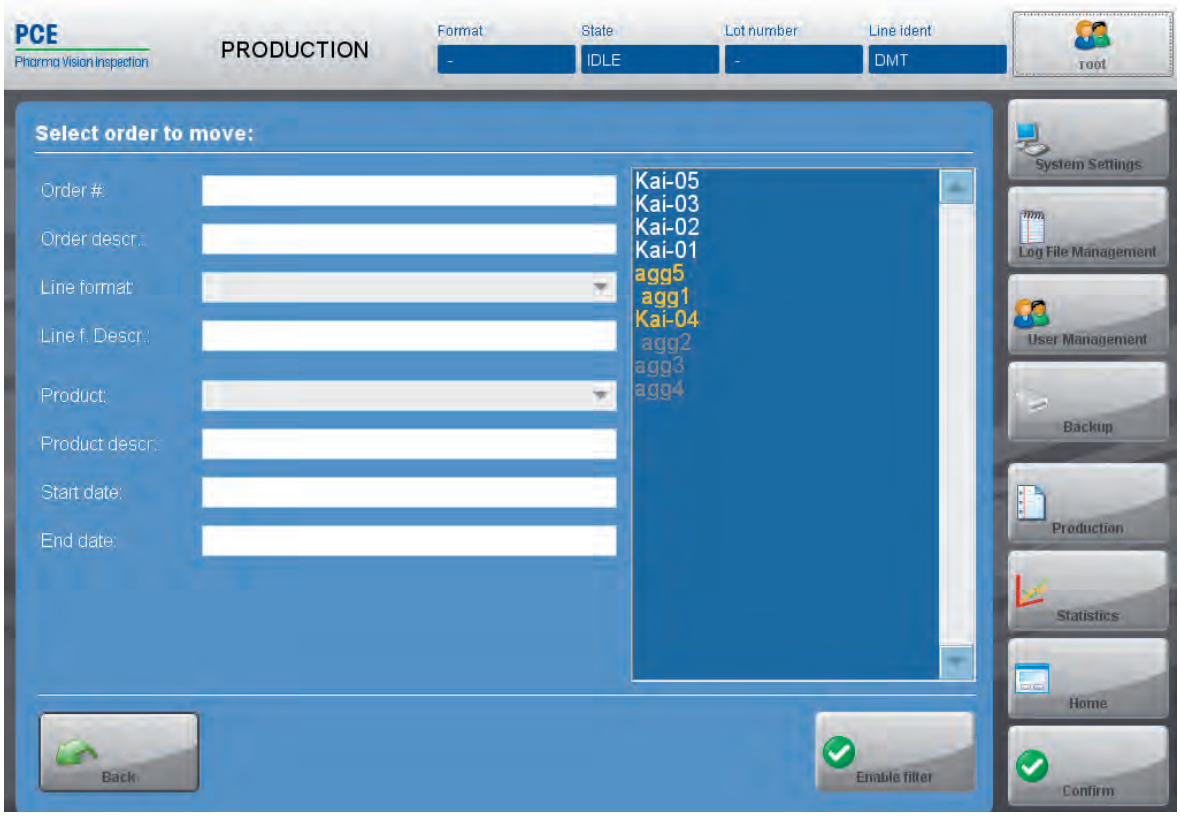


Figure: `Production > Move order to line`

In companies with several lines in a data base, orders can be switched among the various lines via this menu.

Example: Production "line A" has processed an order. This order must now undergo further processing on "line B". The user can use the Pilot Line Manager to suspend this order on "line A" and, taking the existing line formats into account, move the order to "line B". The order is now suspended on "line B" and ready for further processing on line B.

Additional use: Moving an order from an automated line to a reworking place.

7.4.10 Reopening a finished Order

To reopen a finished order you have to own the appropriate user rights.

In case an order was finished but has to be reopened for further processing, follow these steps:

Press `Production > Reset order status > (Select the order you want to reset) > Reset Order.`

7.5 Start / Stop Production (A-3.7.5)

7.5.1 Starting Production via Order (A-3.7.5.1)

At this screen the production is started. At the `Production settings` screen press `Start production via order.` Select the order you want to start. The following screen appears:

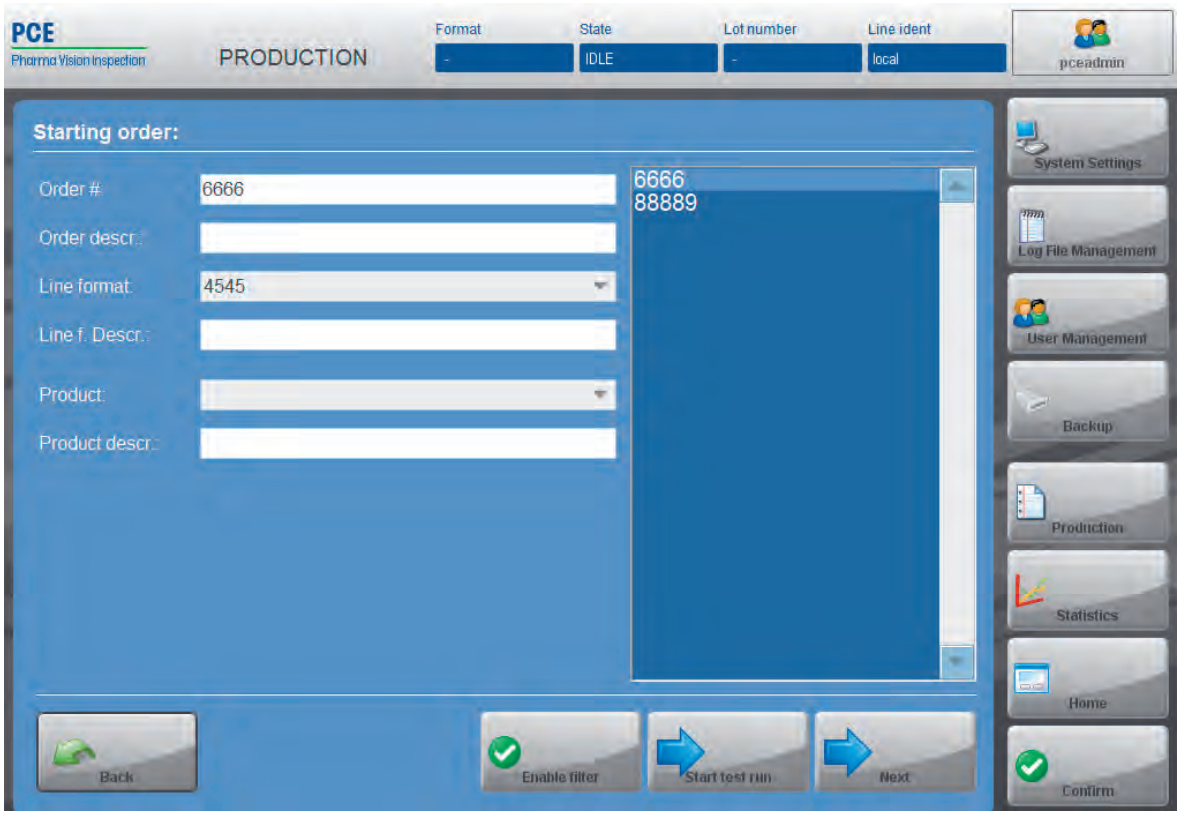


Figure: `Production > Start production via order`

Press `Next.` The parameters entered will be transferred to the connected units and all occurring incidents will be recorded in a protocol file (order protocol). The following screen appears:

Figure: `Production > Start production via order > (select order) Next`

USE BY EXPIRY: At this field use the following date format to input an expiry date: „yyMMdd".

Press `Start Production`. The production starts.

To stop the production press `Finish`. After the machine was stopped manually it has to be started manually to resume the production. Starting automatically is not possible.

Note

Only completed orders are displayed

Only released and completed orders will be available in the list displayed on the screen!

7.5.2 Starting Production via Order > Test Run

Only data from the selected order are used. Serial numbers are assigned but not saved into the database.

Press `Production > Start production via order`. Select the order which contains the values you want to use. The following screen appears:

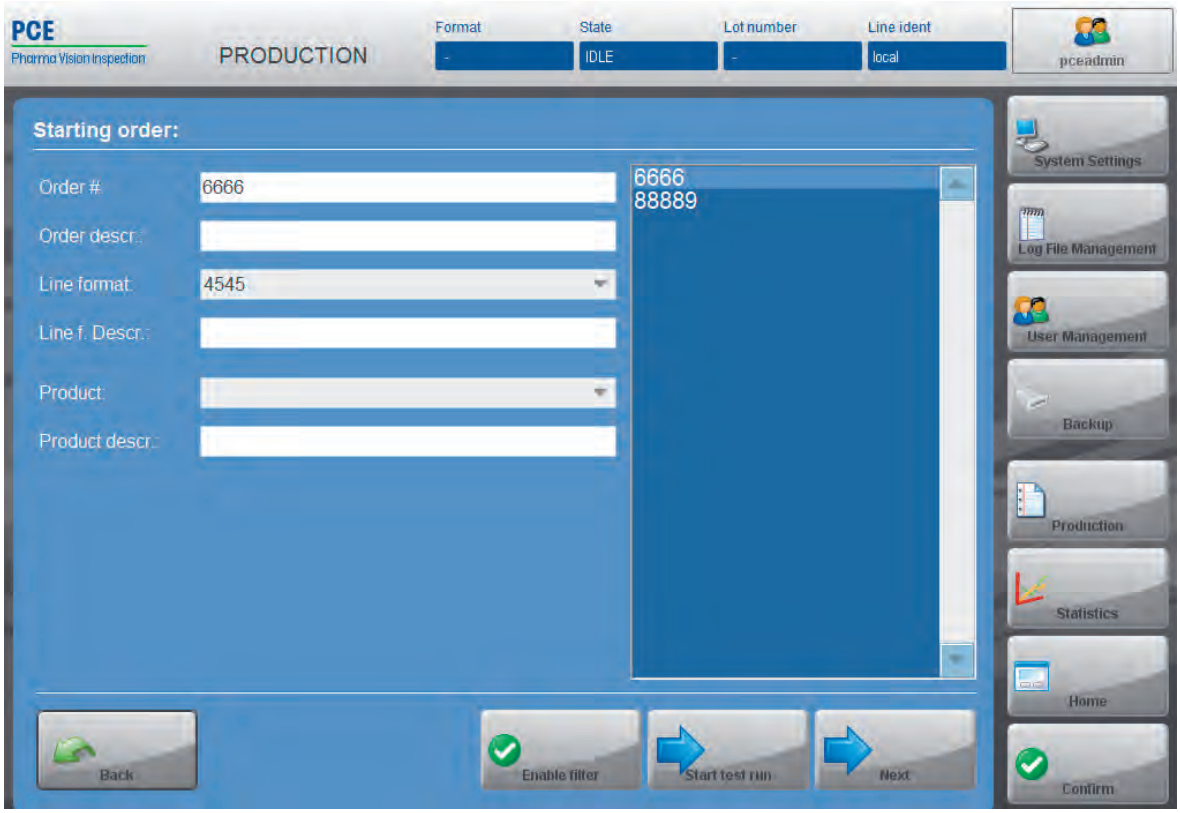


Figure: `Production > Start production via order`

Press `Start Test run.` The parameters entered will be transferred to the connected units. The following screen appears:

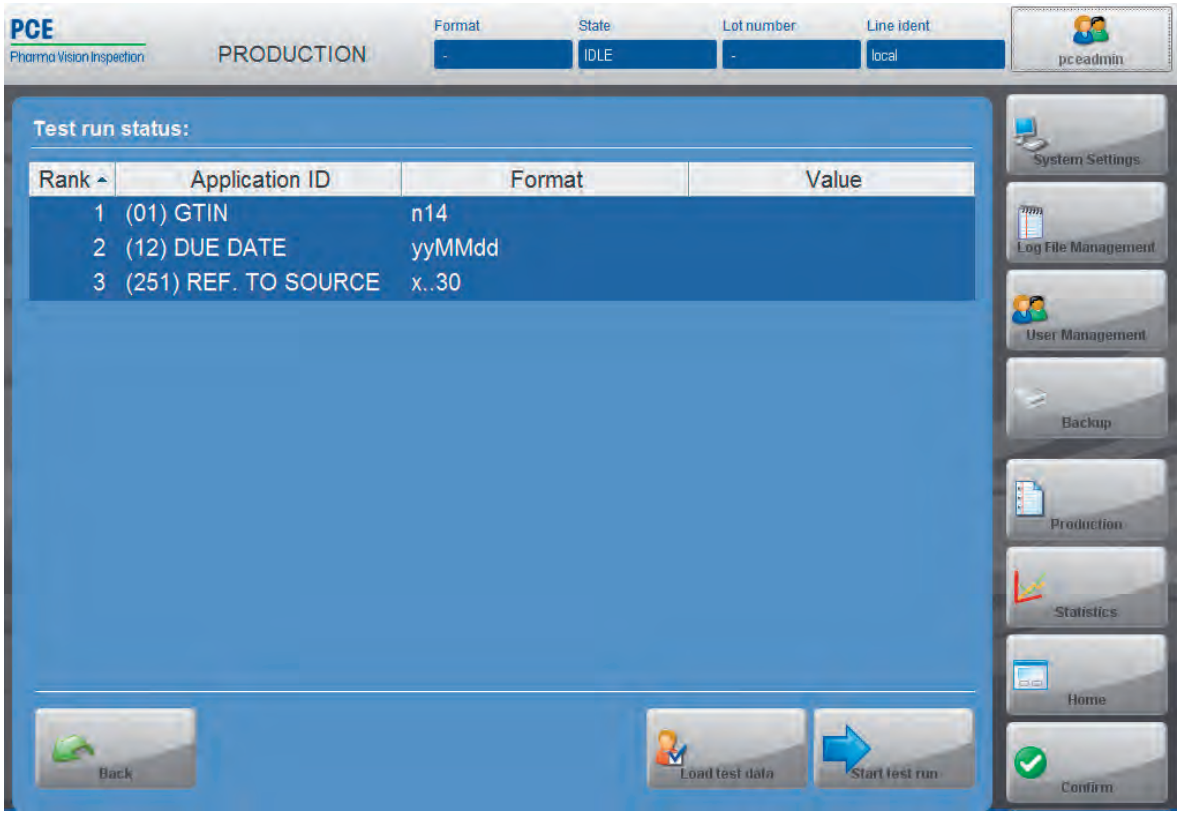


Figure: `Production > Start production via order > (select order) Next`

Here you see the test run data.

DUE DATE: At this field use the following date format to input an expiry date: „yyMMdd".

Load test data: Load data for test run, empty fields are filled with sample data to enable the test performance. Press `Start Test run.` The test run starts.

To stop the test run press `Finish.` After the machine was stopped manually it has to be started manually to resume the production. Starting automatically is not possible.

7.5.3 Starting Test Run via Line Format (A-3.7.5.2)

To check the settings of the line, without wasting serial numbers, a test run can be performed. The counter data will not be recorded in the data base during a test run. To open the `Starting test run` screen press `Test run via line format` at the `Productions Settings` screen (see chapter 7.1 (page 83)). Select the order which contains the values you want to use. The following screen appears:

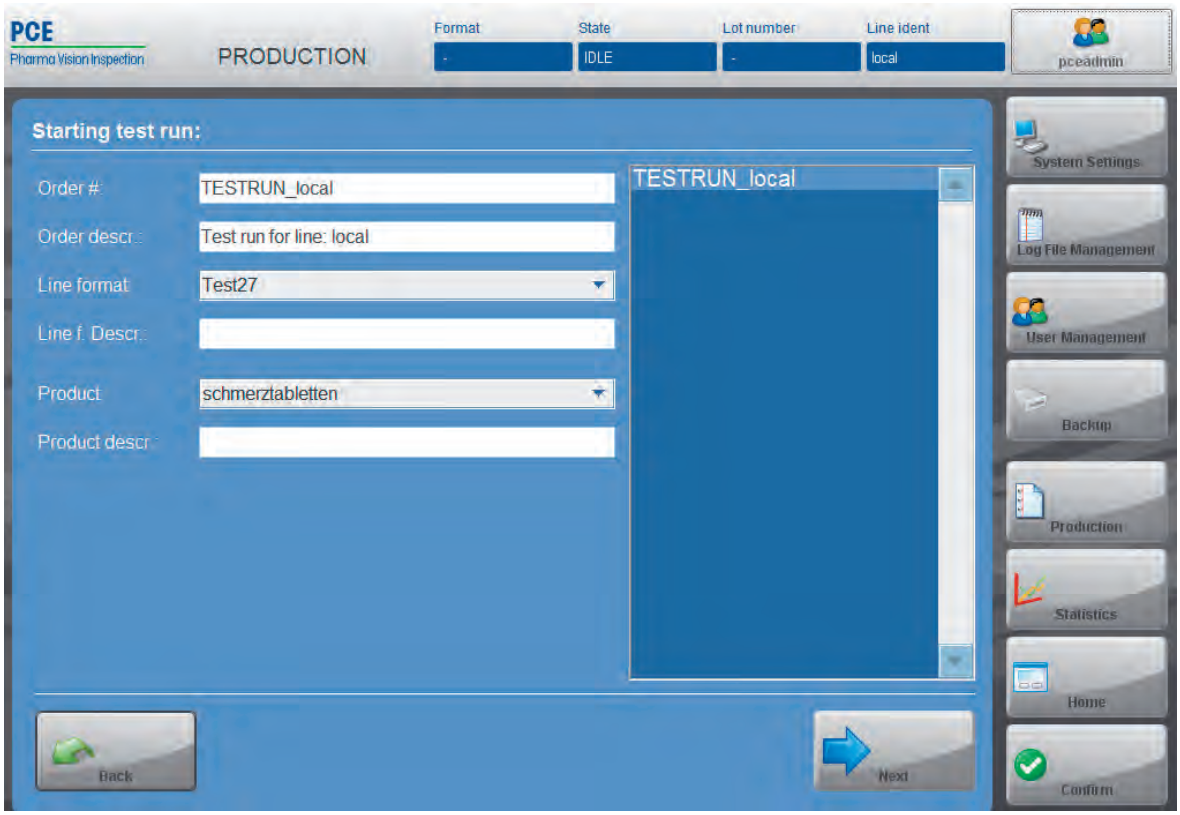


Figure: `Production > Test run via line format`

Select a line format and press `Next.` The following screen appears:

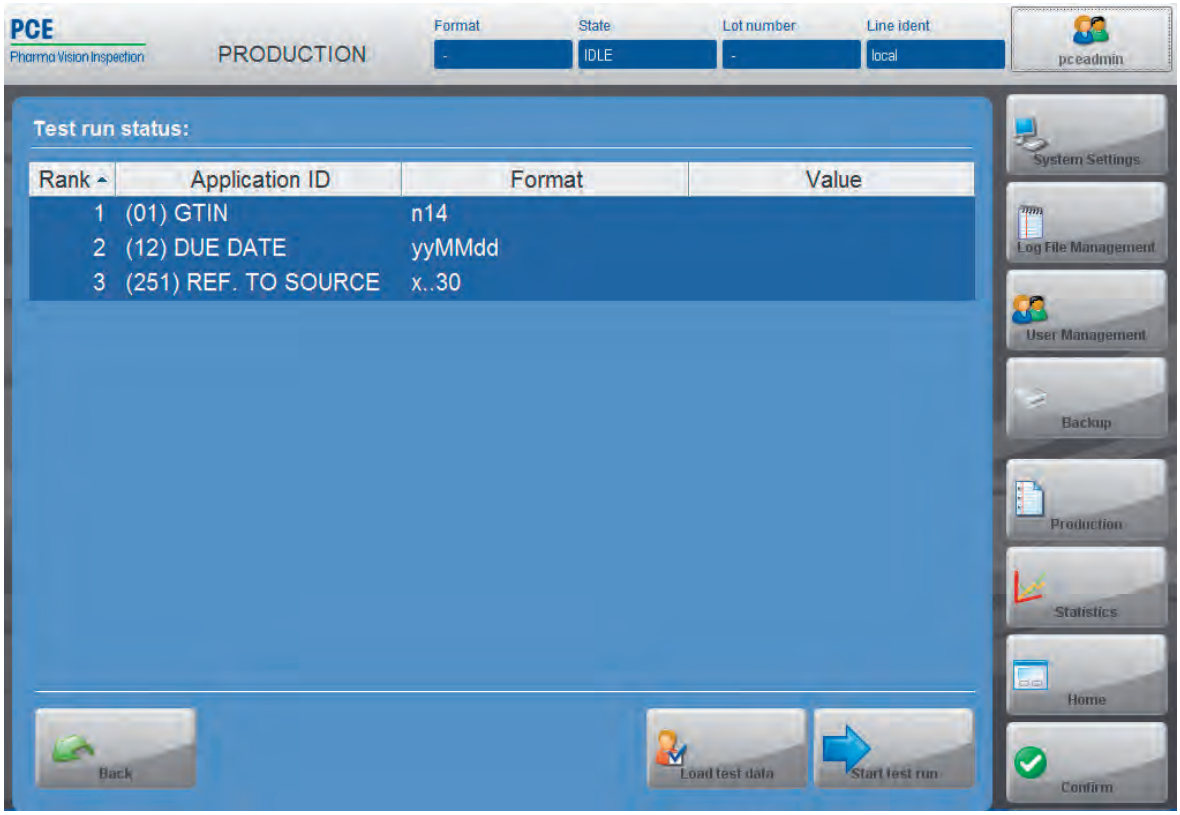


Figure: `Production > Test run via line format > Next`

Here you see the Test run data. The following actions are possible:

Load test data: Load data for test run, empty fields are filled with sample data to enable the test performance.

Start test run: Start the test production

7.5.4 Production Menu during Production

When an order is running you can perform the following actions:

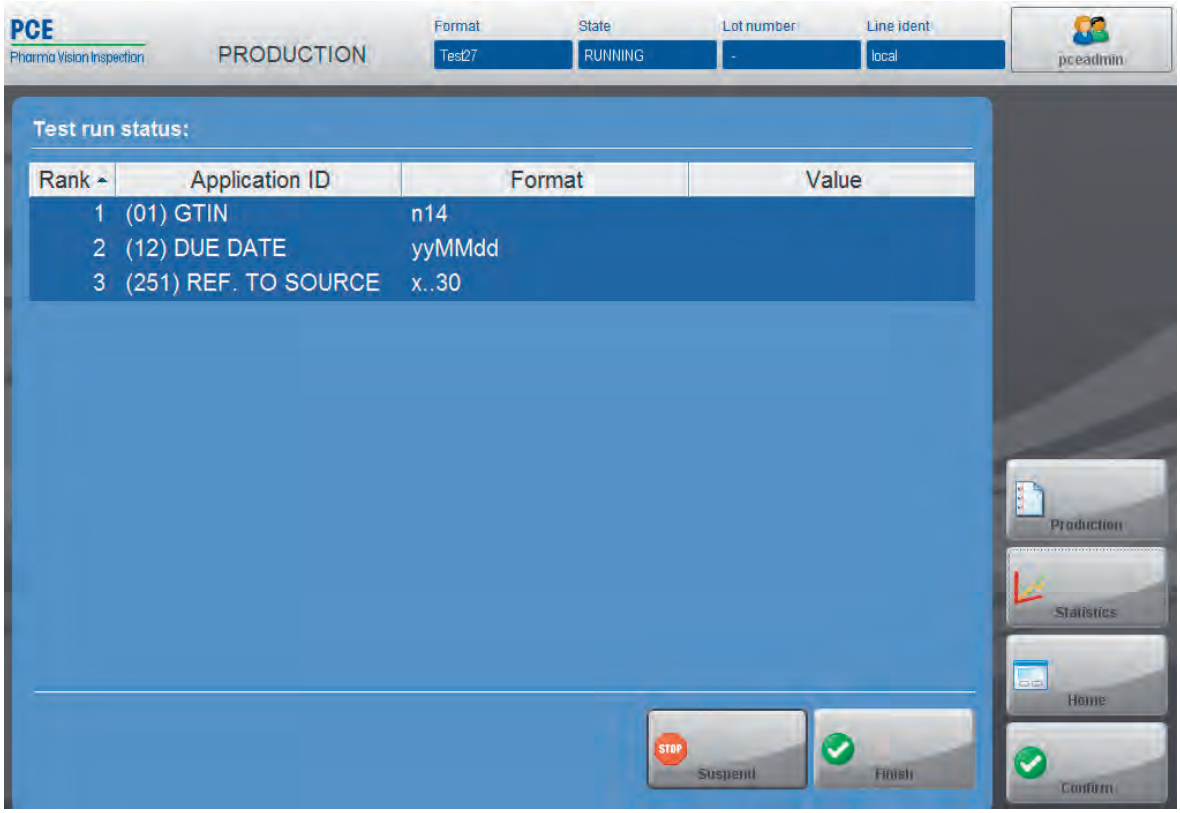


Figure: `Production > Test run via line format > Next > Start test run`

- Suspend: Stops the production without completing the order. Production can be resumed later, even after restarting the PLM.
- Finish: Finish the production (Order will no longer be visible in the order list)

Upon completion of production, a batch protocol can be generated, which can be retrieved under 'Order results create report'.

7.6 Serialization (A-3.7.6)

The serial number is printed to the items as plain text and encrypted at the data matrix code. The serial number is always used in conjunction with the GTIN.

7.6.1 Internal Handling of SNs (A-3.7.6.1)

At start of production you have to input the count of serial numbers to be used for the serialization.

These numbers are saved to the DB and set to status "in use". After starting the production the serial numbers are printed sequentially on the items.

When the inspection performed by the camera results in a flawless print, the status of the corresponding serial number is set to "true" at the DB. If the inspection results in a faulty printer result, the status of the corresponding serial number stays on "in use".

If an unforeseen interruption of production arises (e.g. due to power failure), all following serial numbers that were in the intermediate storage of the printer will be discarded. The number of cached serial numbers in the printer is variable and can be set in the printer settings in the printer.

Consumption of serial numbers should be limited to physical use, e.g. loss of SN due to buffering reasons should be as low as possible. Do just buffer reasonable quantity of serial numbers to avoid waste. It is possible to enter or eliminate individual items at the database using a hand scanner.

7.6.2 Serialization Settings at the PLM Software

First create a line format, which includes besides the GTIN also a field for serial numbers. See chapter 7.2.3 (page 84).

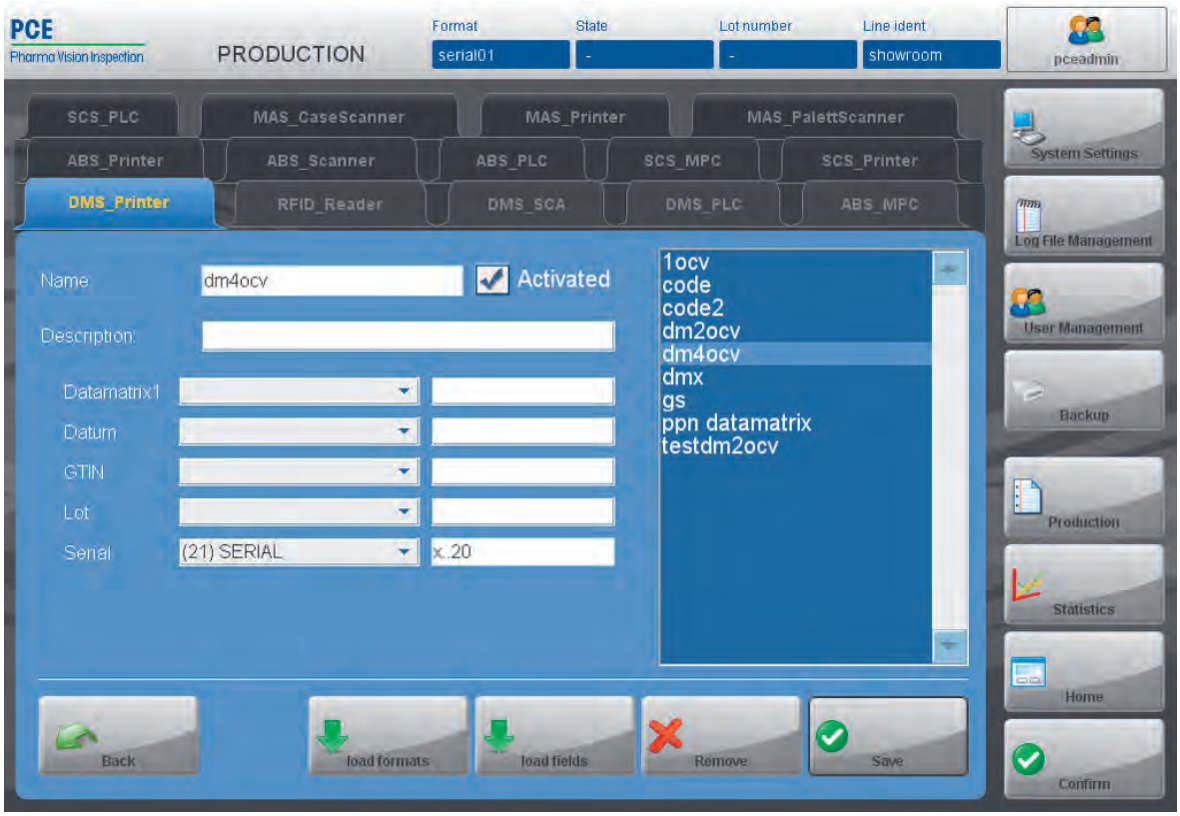


Figure: `Production > Add/Edit line format > Devices > Wolke Printer tab`

From the drop-down menu of the 'Serial' field assign the serial number "(21) SERIAL" to the Application Identifier. Thereby the line format is assigned as serialization.

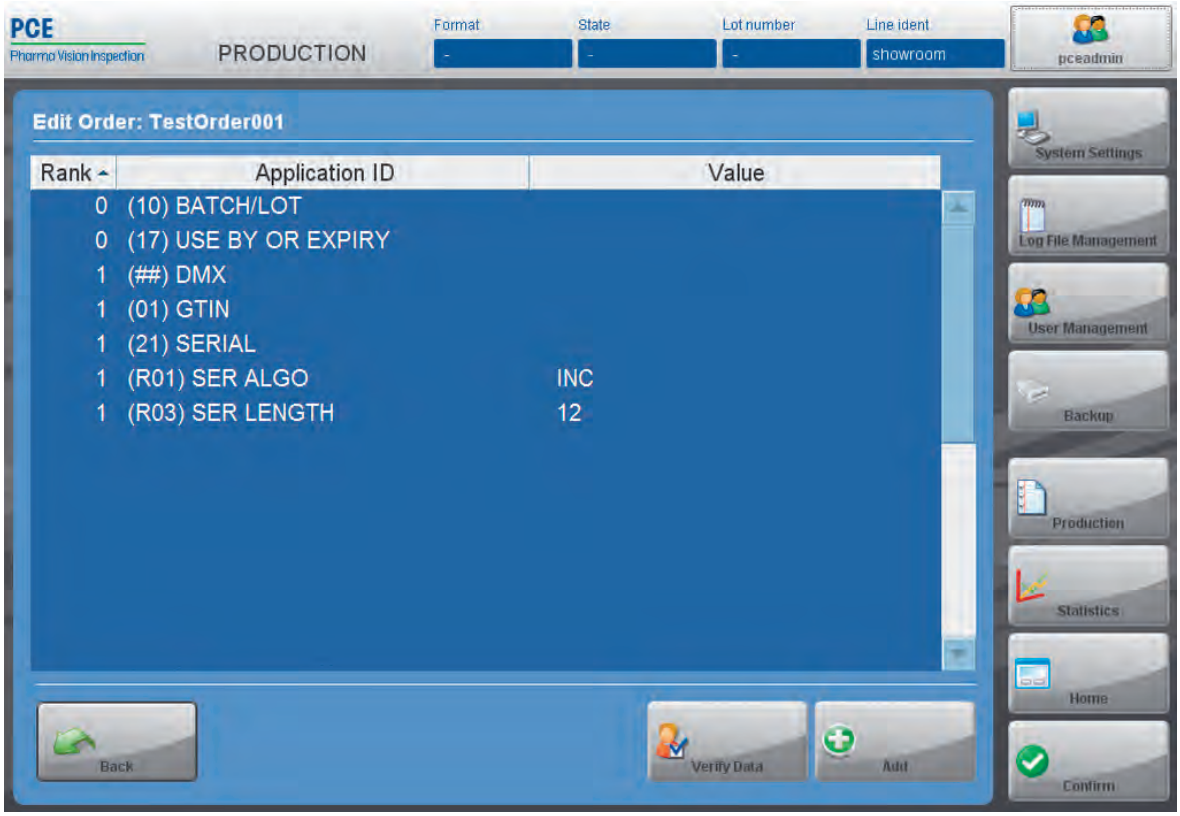


Figure: `Production > Add/Edit order (select an order) > Details`

Press `Production > Add/Edit order` and select an order. Press Details. Add the field SER ALGO' if not existing. Assign the desired algorithm to the field 'SER ALGO' (serialization algorithm)

Algorithms:

- INC: Each serial number is increased by "1" to the previous one
- INC1 …INC999999: Each serial number is increased by 1 … 999999 to the previous one.
- INCRND1 … INCRND999999**:** Each serial number is increased by a random number between 1 … 999999 (both included) to the previous one.
- IMPORT: The serial numbers from a list are used, which have previously been imported from a company resource planning system (ERP system).

Enter the desired length of the serial number in the field 'SER LENGTH' (maximum 20).

7.7 Aggregation (A-3.7.8)

All actions concerning aggregation are recorded automatically into the database. Dependencies between aggregation units and serial numbers are recorded. Uniqueness and validity of serial numbers are checked constantly across all ranks and actions. This permanent control guarantees traceability of each product and overview about the whole production line.

7.7.1 Functional Principle of Aggregation (A-3.7.8.1)

Aggregation is the classification and capture of the smallest units (e.g. folding boxes) to higher-rank units (e.g. bundles, cases and pallets). At each aggregation rank, unambiguous assignment of units to parent-child aggregation ranks is done.

The identification of the units is done by printing on the unit itself or by printing on labels which are affixed to the unit. The following example shows the typical aggregation ranks. This example refers to the whole aggregation chapter to describe the settings.

Note

This chapter refers to the example therein

At this chapter all settings refer to the following example with four aggregation ranks. If your line is set up in another way you have to modify the settings accordingly

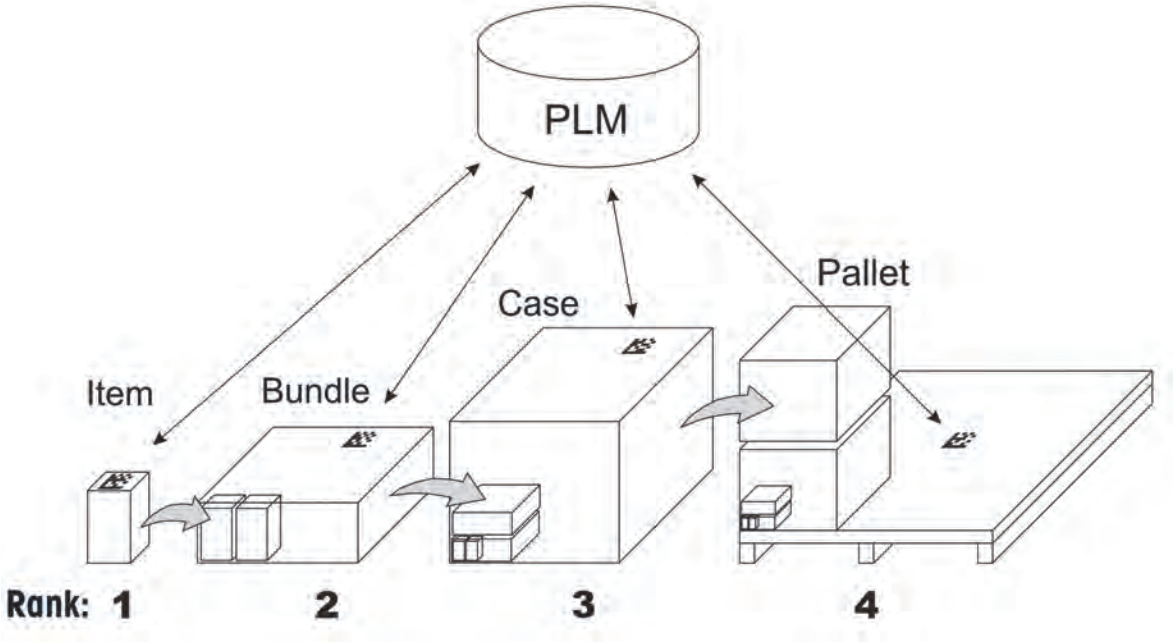


Figure: Principle of aggregation

At the following table the terms for aggregation units are described for a line with 4 aggregation ranks.

Trade Unit	Rank	Explanation

Item	1	An item is the smallest unit at the aggregation process. This can be a folding box, a blister or a bottle for example. It is usually aggregated to a bundle or directly to a shipping case.
Bundle	2	A bundle consists of several items.
Case	3	A case is a carton box where either bundles or items directly are packed into.
Pallet	4	A pallet contains several cases.
Unit	1/2/3/4	A unit is the term for any aggregation rank. The term unit is used for an item (Rank1), bundle (Rank2), a shipping case (Rank3), or a pallet (Rank4).

The PLM software principally allows up to 8 aggregation ranks (rank1- rank8). Thus it is possible to aggregate an item seven times. The number of aggregation steps depends on the individual line.

The aggregation steps can be executed by one of the four stations:

- Data Matrix Station (DMS)
- Advanced Bundle Station (ABS)
- Shipping Case Station (SCS)
- Manual Aggregation Station (MAS)

Code Reading

Automatic reading is done by the following devices:

- Smart Camera (**SMC**) – Sequential reading of codes and OCV
- **High Resolution Camera**(**HRC**) – Simultaneous or sequential reading of codes and OCV
- Comparator (VGL) + Laser scanner – Sequential reading of codes

Manual reading of codes can also be carried out using a hand scanner.

Offset Rank and Child Rank

At performing aggregation steps important settings are the 'offset rank' and the 'child rank'. Their meaning is listed at the following table:

Name	Explanation	Example	Setting of example
Offset Rank	The number of the rank where the labels that have to be scanned come from.	E.g. Items come from rank1 and have to be bundled at rank2.	Offset rank setting at rank3 station is "rank1"
Child Rank	The rank in which the items that have to be aggregated were aggregated before scanning.	E.g. Items come from rank1, have been bundled at rank2 and have to be aggregated to a case at rank3.	Child rank setting at rank3 station is "rank2"

7.7.2 Serialization / Aggregation Preconditions

To perform Aggregation at the stations the following must be given:

- Production is running via order
- Aggregation settings have to be made at the PLM and possibly at the corresponding software interface from camera and printer

7.7.3 Serialization with DMS (A-3.7.7.3)

The DMS serializes the items by printing all needed information on their labels. Verification of serial numbers and labels is done by the **SMC**. Serial numbers are saved into the database with status: "verified". The Items are then at rank1. Serialization at the DMS is performed automatically. Serialization is achieved by appropriate settings at the PLM, the **SMC** software interface (See chapter 6.2.8.2 (page 50)) and the printer software interface. For examples of serialization/aggregation settings see chapter 7.7.8 (page 118).

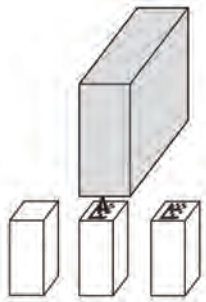
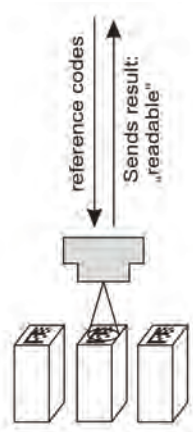
7.7.4 Aggregation Status (A-3.7.7.4)

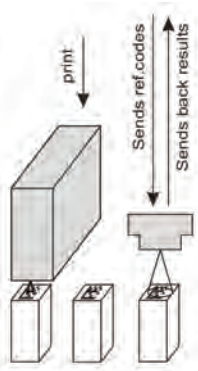
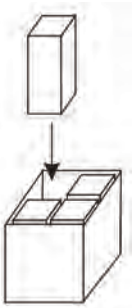
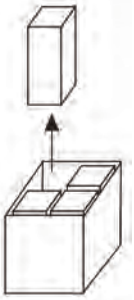
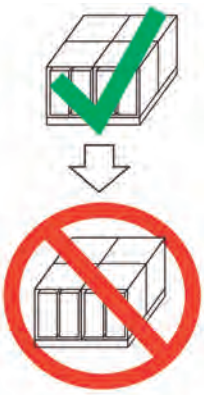
The aggregation status is the status in which a unit is actually in. In this chapter it is described in which status a unit is in after an aggregation step.

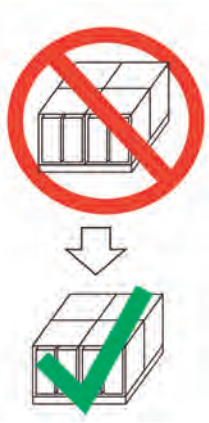
Aggregation (Verification, Validation) are usually done automatically by reading devices (scanners, hand scanners, cameras, RFID readers).

Deaggregation, Decommissioning and commissioning are usually done manually by hand scanners. For rework purposes, all aggregation steps can also be executed manually by selecting the serial numbers at the PLM and executing the corresponding function.

For every unit there is a serial number needed. So if the terms: item, case, pallet, parent unit or child unit are mentioned, remember that the corresponding serial number and label are always meant, too.

Action	Explanation	Status Result
Print 	Printed but not verified.	Printed=1 Verified=0 validated=0 commissioned=0 aggregated=0
Verification 	Printed and recorded to database. Print quality is verified but SN is not yet validated.	Printed=1 Verified=1 validated= 0 commissioned=1 aggregated=0/1
Validation	SN is verified and matching with database entry.	Printed=1 Verified=1 validated=1 commissioned=1 aggregated=0/1

Serialization 	This comprises print verification and validation of item SN. The SN is saved to the DB.	Printed=1 verified=1 validated=1 commissioned=1 aggregated=0
Aggregation 	Verified, matching with database entry and aggregated. a) Creating a parent unit by bundling the needed count of child units (content size) together. -> E.g.: Item to case: Creating a case by scanning the items. Case label is printed. b) Adding one or more child units to a incomplete parent unit. -> E.g.: Adding a case to a pallet.	Printed=1 Verified=1 validated= 1 commissioned=1 aggregated=1
Deaggregation 	Removing a child unit from an aggregated parent unit. The child unit can be aggregated again. E.g.: Taking a case (child unit) out of a pallet (parent unit).	Printed=1 Verified=1 validated= 1 commissioned=1 aggregated=0
Decommission 	When decommissioning a unit, the unit itself and all associated child units are decommissioned. Validated status is set to "0". When a unit is decommissioned, this means the serial number stays verified at the database but blocked and it cannot be used until it is commissioned again. -> E.g.: There is an aggregation; item in bundle in case in pallet. It is subsequently found that for some items of the case the wrong folding boxes have been used. So the whole pallet is decommissioned and wrong items can be separated later.	Printed=1 Verified=1 validated=0 commissioned=0 aggregated=0/1

Commission 	Commission is used to unblock units (or serial numbers respectively) that have been decommissioned before, in order to reuse it.	Printed=1 Verified=1 validated=1 commissioned=1 aggregated=0/1
Destroy	Destroy refers to an aggregated unit (items cannot be destroyed).When destroying a unit, this means the last aggregation is reversed (deeper aggregation ranks remain). The label has to be discarded and serial number is decommissioned.	Printed=1 Verified=1 validated= 0 commissioned=0 aggregated=0

7.7.5 Aggregation with ABS

The ABS aggregates (child) items to (parent) bundles. A **HRC** sends the (child) serial numbers to the PLM which ads it to the bundle. A printer prints a label for the bundle. The label is then checked by a scanner and the bundle serial number is saved into the database with status: "verified".

Aggregation at the ABS is done by performing the following steps:

Step	Description	Explanation
1	At the ABS monitor switch from PLM to MPI **HRC-AI Software** using the switch button.	Switch button to use the MPI Interface
2	Place bundle (not yet aggregated) on the conveyer belt.	Labels facing the camera.
3	Wait until aggregation is done.	Scanning, printing, labeling and checking of the label are done automatically.

The different aggregation possibilities like changing the count of items at a bundle are achieved by appropriate settings at the PLM and at the corresponding software interfaces of cameras and printers. For examples of aggregation settings see chapter 7.7.8 (page 118). Manual aggregation actions are described in chapter 7.7.9 (page 123).

Number of Columns

The **HRC** at the ABS takes a photo of every column of items in a bundle and the MPI software merges these to one picture. At the following example the bundle has four columns, so four photos are taken.

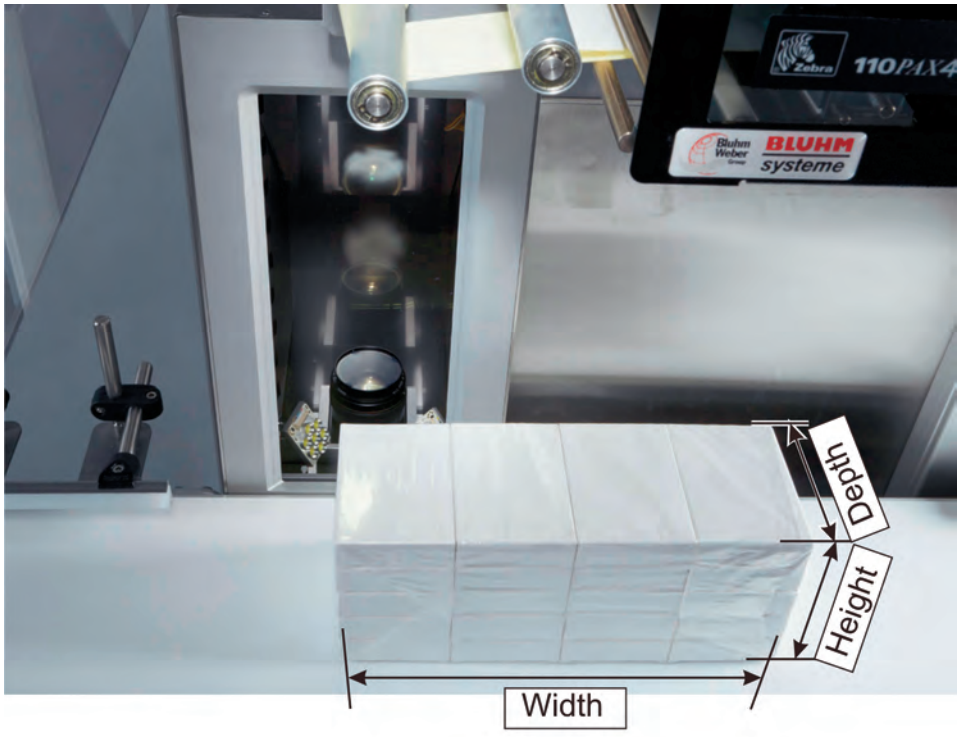


Figure: Bundle Measures

To calculate the time points when the photos have to be taken, the ABS needs the measures of the bundles and the measures of the items as well as the number of columns. The number of columns has to be entered under the PLC system settings and there at the parameter 'Number of Columns'.

7.7.6 Aggregation with SCS

The SCS aggregates (child) items or bundles to (parent) cases. A manually triggered **HRC** sends the (child) serial numbers to the PLM which ads it to the case. A printer prints a label for the case. The label is then checked by a hand scanner and the case serial number is saved into the database with status: "verified". Aggregation at the SCS is done by performing the following steps:

Step	Description	Explanation
1	At the SCS monitor switch from PLM to **HRC-AI Software**software using the switch button.	Switch button to use the MPI Interface
2	Place units equal to the number of items of a shipping case into the shipping case on the SCS table.	Place shipping case centered at the camera screen.
3	Press foot pedal to take a picture of the folding boxes.	An image is captured; Green boxes are place around data matrix code; a blue light is displayed confirming the aggregation; a case label is printed automatically from the printer
4	Verify the case label barcode by scanning it with the SCS hand scanner.	The unit is verified at the database.

The different aggregation possibilities are achieved by appropriate settings at the PLM and at the corresponding software interfaces of cameras and printers. Examples for aggregation settings you find at chapter 7.7.8 (page 118). Manual aggregation actions are described in chapter 7.7.9 (page 123).

7.7.7 Aggregation with MAS

The MAS aggregates (child) cases, bundles or items to (parent) pallets. A hand scanner sends the (child) serial numbers to the PLM which ads it to the pallet. A printer prints a label for the pallet. The label is then checked by a hand scanner and the pallet serial number is saved into the database with status: "verified". Aggregation at the MAS is done by performing the following steps:

Step	Description	Explanation

1	At the MAS monitor switch from PLM to **HRC-AI Software** using the switch button.	Switch button to use the **HRC-AI Software** Interface
2	Use case hand scanner and scan the labels of the cases you want to aggregate.	After scanning the number of cases equal to the predefined content size (AI37), the label for the pallet will be printed automatically.
3	Use pallet hand scanner and scan the label of the pallet to verify it.	The pallet label is verified.

The different aggregation possibilities are achieved by appropriate settings at the PLM and at the corresponding software interfaces of cameras and printers. Examples for aggregation settings you find at chapter 7.7.8 (page 118). Manual aggregation actions are described in chapter 7.7.9 (page 123).

7.7.8 Aggregation Examples

In this chapter the most common examples of aggregation are described. All settings given here refer to the example with four aggregation ranks. If your line is set up in another way you have to modify the settings accordingly.

All aggregation stations can aggregate the previous unit by scanning the labels from the previous unit or by scanning the labels from lower units. This means; for example if you have aggregated three ranks (item, bundle, case) it is possible to aggregate the case (rank3) to the pallet (rank4) by scanning the labels of the case or by scanning the label of the bundle or by scanning the labels of the items.

General Settings:

For all examples the following settings (edit at `System Settings > Edit Device Settings`) are the same:

- The serialization printer (printer of the DMS) is set to Printer Mode: BUFFERED_PRINTER
- The serialization reader (SMC of the DMS) is set to Reader Mode: PRINT_INSPECTION
- The aggregation printers (printer of ABS, SCS, MAS) are set to Printer Mode: AGGREGATE_PRINTER
- The aggregation readers (reader of ABS, SCS, MAS) are set to Reader Mode: AGGREGATE_READER
- Global Scanners are set to Reader Mode: PRINT_INSPECTION
- Aggregation Scanners are set to Reader Mode: AGGREGATE_READER
- When using SSCC numbers for incomplete units see chapter 7.7.9.9 (page 127)

7.7.8.1 Item - Bundle - Case (by Reading Bundle Labels) - Pallet

Here it is described how to aggregate items to bundles to case (by reading the codes of the bundle labels) to pallet. See the following figure:

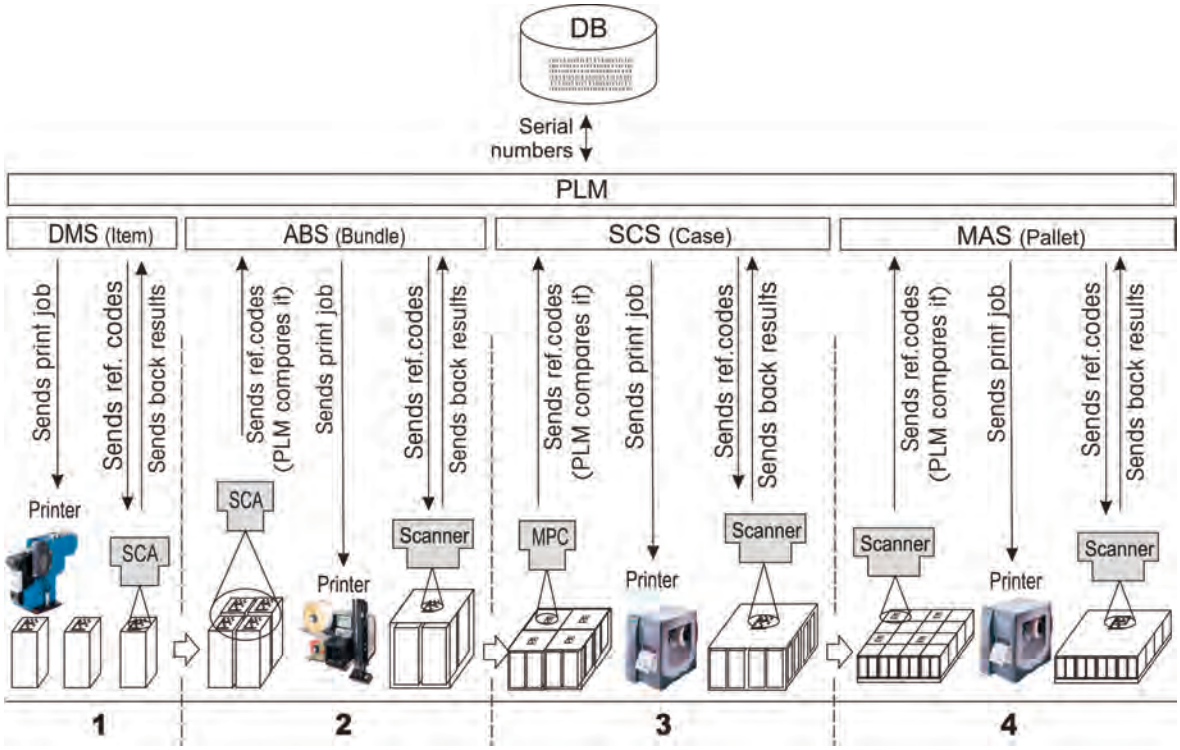


Figure: Item - Bundle - Case (by reading bundle labels) - Pallet

At all aggregation stations (ABS, SCS and MAS) the labels of the units aggregated before are read. This is the most frequently used procedure.

For this example you have to make the following settings:

Station	Where to edit	Settings	Explanation
DMS	At start of the production or at the order or at the product	Enter agg. GTIN for rank2	One GTIN for each rank
	At the line format	Enter item dimensions	
	-	Offset rank= -	
		Child rank= -	
ABS	At start of the production or at the order or at the product	Enter agg. GTIN for rank2	One GTIN for each rank
	At the product and at the PLC	Enter item and bundle dimensions	
	Production > Edit Line Format > Devices (**HRC**, laser scanner)	Offset rank=1	Before scanning is done, the labels that have to be scanned are aggregated at = rank1 (DMS)
		Child rank=1	The labels that have to be scanned come from = rank1 (DMS)
	See chapter 7.7.5 (page 116) Aggregation with ABS (page 116)	Number of layers	As high as count of items in turn
SCS	At start of the production or at the order or at the product	Enter agg. GTIN for rank3	One GTIN for each rank
	At the product and at the PLC	Enter case dimensions	
	Production > Edit Line Format > Devices (**HRC**, hand scanner)	Offset Rank=2	Before scanning is done, the labels that have to be scanned are aggregated at = rank2 (ABS)
		Child Rank=2	The labels that have to be scanned come from = rank2 (ABS)

MAS	At start of the production or at the order or at the product	Enter agg. GTIN for rank4	One GTIN for each rank
	Production > Edit Line Format > Devices (hand scanners)	Offset Rank=3	Before scanning is done, the labels that have to be scanned are aggregated at = rank3 (SCS)
		Child Rank=3	The labels that have to be scanned come from = rank3 (SCS)

7.7.8.2 Item - Bundle - Case (by Reading Item Label) - Pallet

Here it is described how to aggregate items to bundles to case (by reading the codes of the items) to pallet. Performing this aggregation leads to the same result as scanning the bundle labels; the bundles are aggregated to the case. See the following figure:

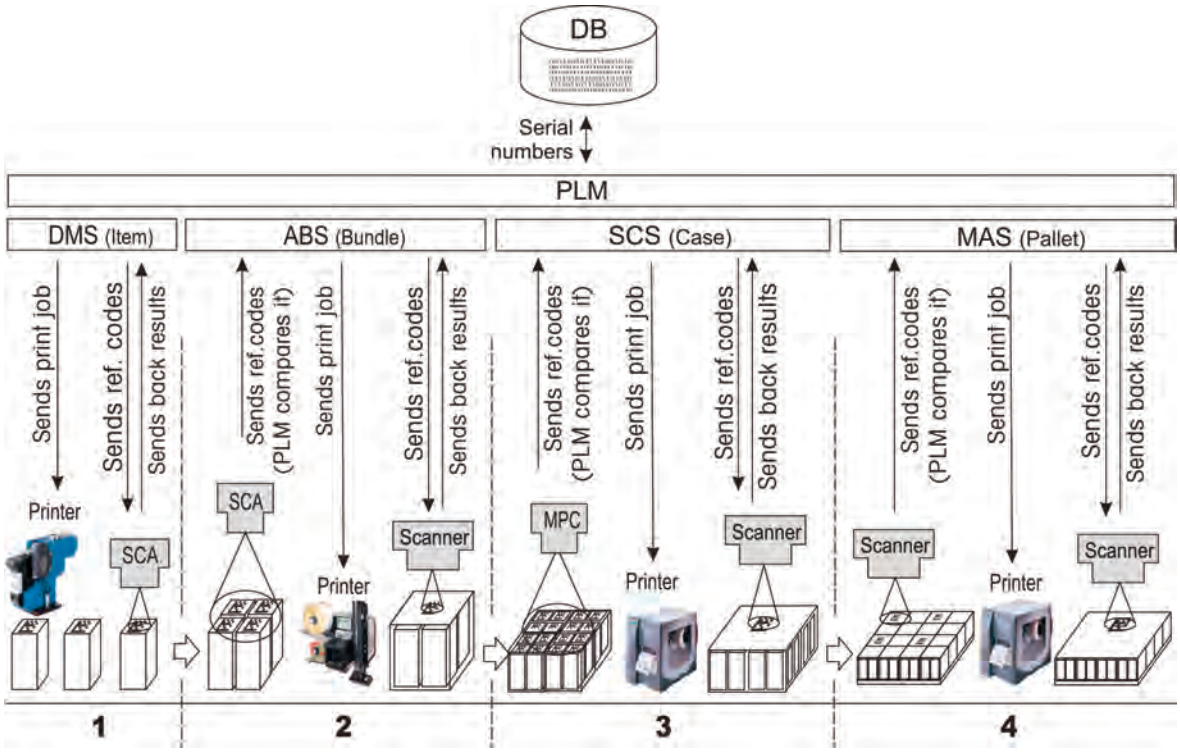


Figure: Item - Bundle - Case (by reading item label) - Pallet

At the SCS (rank3) the item labels from the DMS (Rank1) are read instead of the bundle labels from the ABS (rank2). This can be useful if it is not possible to capture the bundle labels when the bundles are packed into the case.

For this example you have to make the following settings:

Station	Where to edit	Settings	Explanation
DMS	At start of the production or at the order or at the product	Enter agg. GTIN for rank2	One GTIN for each rank
	At the product and at the PLC	Enter item dimensions	
		Offset rank= -	
		Child rank= -	

ABS	At start of the production or at the order or at the product	Enter agg. GTIN for rank2	One GTIN for each rank
	At the product and at the PLC	Enter item and bundle dimensions	
	Production > Edit Line Format > Devices (**HRC**, laser scanner)	Offset rank=1	Before scanning is done, the labels that have to be scanned are aggregated at = rank1 (DMS)
		Child rank=1	The labels that have to be scanned come from = rank1 (DMS)
	See chapter 7.7.5 (page 116) Aggregation with ABS (page 116)	Number of layers	As high as count of items in turn
SCS	At start of the production or at the order or at the product	Enter agg. GTIN for rank3	One GTIN for each rank
	At the product and at the PLC	Enter case dimensions	
	Production > Edit Line Format > Devices (**HRC**, hand scanner)	Offset Rank=2	Before scanning is done, the labels that have to be scanned are aggregated at = rank2 (ABS)
		Child Rank=1	The labels that have to be scanned come from = rank1 (DMS)
MAS	At start of the production or at the order or at the product	Enter agg. GTIN for rank4	One GTIN for each rank
	Production > Edit Line Format > Devices (hand scanners)	Offset Rank=3	Before scanning is done, the labels that have to be scanned are aggregated at = rank3 (ABS)
		Child Rank=3	The labels that have to be scanned come from = rank3 (ABS)

7.7.8.3 Item - Case - Pallet

Here it is described how to aggregate items to case to pallet without having bundles. See the following figure:

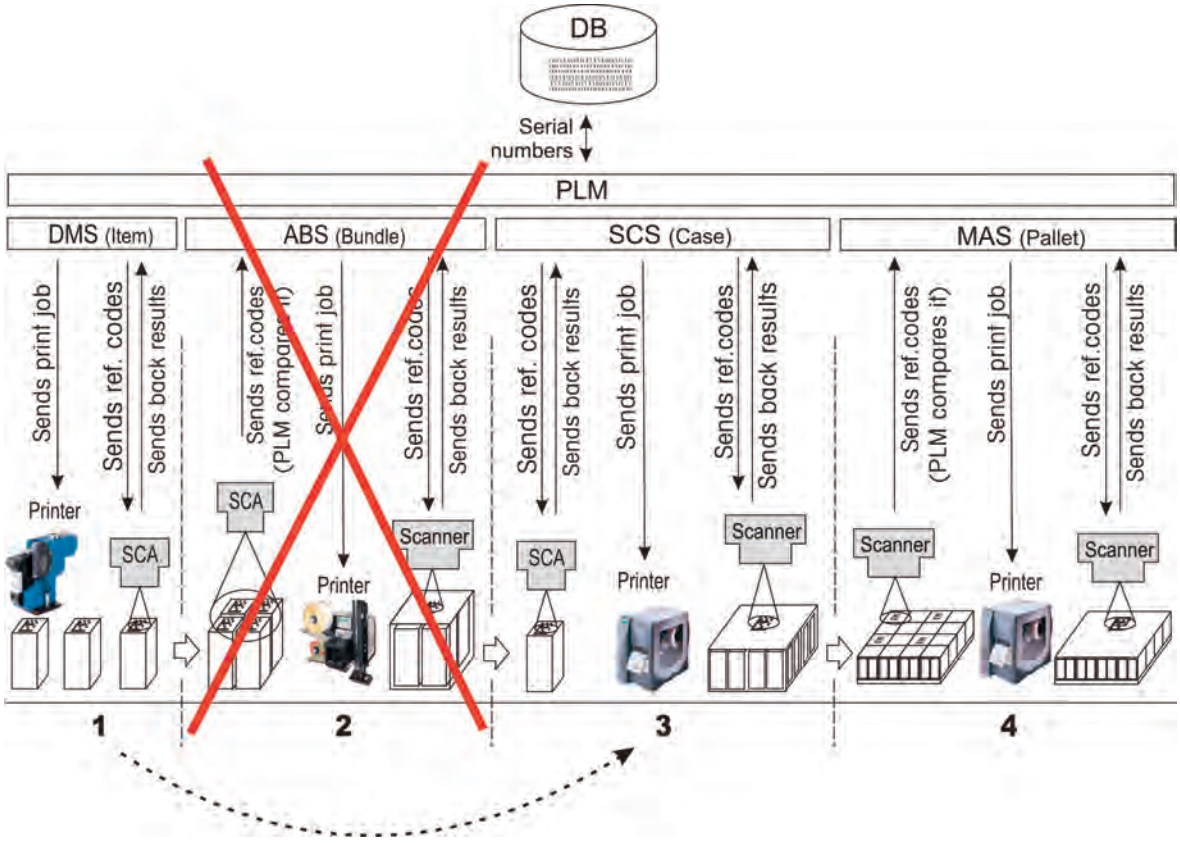


Figure: Item - Case - Pallet

The ABS (rank2) is not used. Note that rank2 still exists. This has to be considered at the line settings.

For this example you have to make the following settings:

Station	Where to edit	Settings	Explanation
DMS	At start of the production or at the order or at the product	Enter agg. GTIN for rank2	One GTIN for each rank
	At the product and at the PLC	Enter item dimensions	
	At System Settings > Edit Device Settings	Offset rank= -	
		Child rank= -	
ABS	-	-	ABS is not used
SCS	At start of the production or at the order or at the product	Enter agg. GTIN for rank3	One GTIN for each rank
	At the product and at the PLC	Enter case dimensions	
	Production > Edit Line Format > Devices (**HRC**, laser scanner)	Offset Rank=1	Before scanning is done, the labels that have to be scanned are aggregated at = rank1 (DMS)
		Child Rank=1	The labels that have to be scanned come from = rank1 (DMS)
MAS	At start of the production or at the order or at the product	Enter agg. GTIN for rank4	One GTIN for each rank
	Production > Edit Line Format > Devices (hand scanners)	Offset Rank=3	Before scanning is done, the labels that have to be scanned are aggregated at = rank3 (ABS)
		Child Rank=3	The labels that have to be scanned come from = rank3 (ABS)

7.7.8.4 Item - Pallet

Here it is described how to aggregate items to pallet without having bundles or shipping cases. See the following figure:

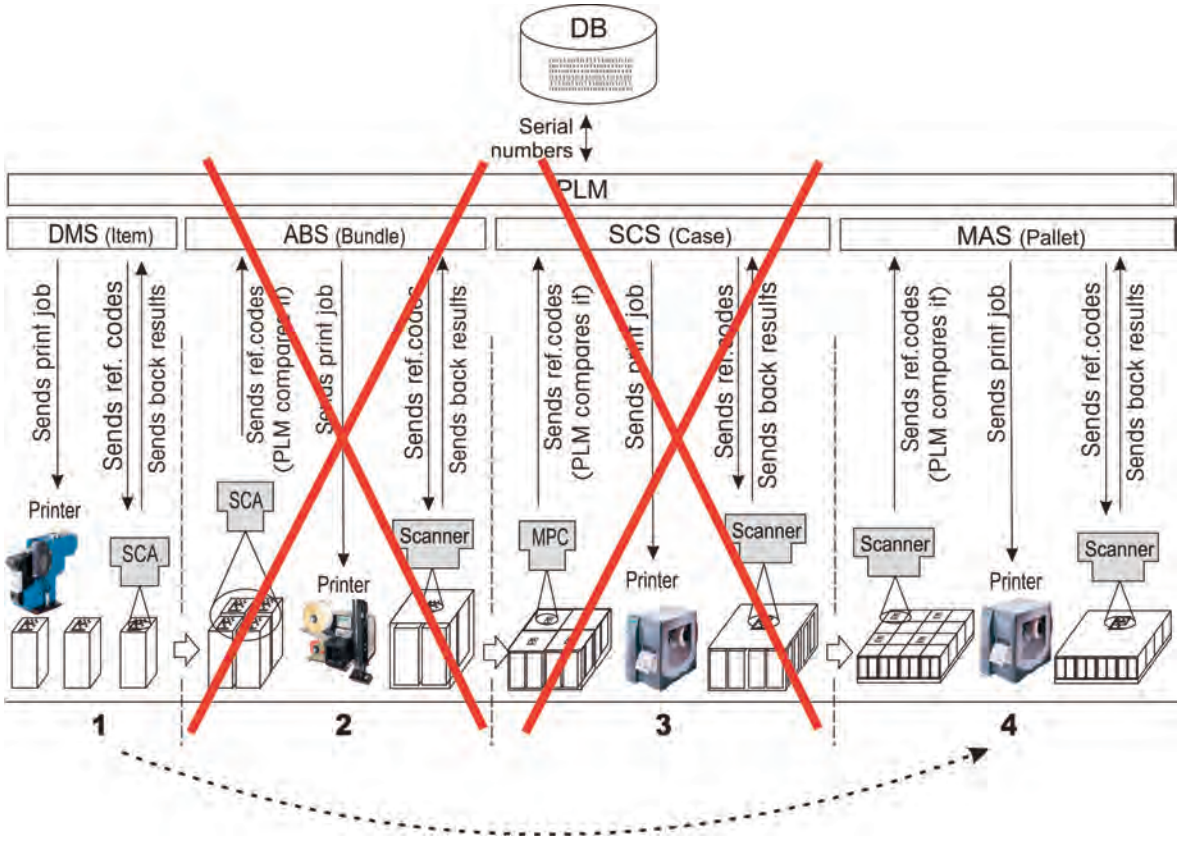


Figure: Item - Pallet

The ABS (rank2) and the SCS (rank3) are not used. Note that rank2 and rank3 still exist. This has to be considered at the line settings.

For this example you have to make the following settings:

Station	Where to edit	Settings	Explanation
DMS	At start of the production or at the order or at the product	Enter agg. GTIN for rank2	One GTIN for each rank
	At the product and at the PLC	Enter item dimensions	
	At System Settings > Edit Device Settings	Offset rank=-	
		Child rank=-	
ABS	-	-	ABS is not used
SCS	-	-	SCS is not used
MAS	At start of the production or at the order or at the product	Enter agg. GTIN for rank4	One GTIN for each rank
	Production > Edit Line Format > Devices (hand scanners)	Offset Rank=1	Before scanning is done, the labels that have to be scanned are aggregated at = rank1 (DMS)
		Child Rank=1	The labels that have to be scanned come from = rank1 (DMS)

7.7.9 Manual Aggregation Actions (A-3.7.7.8)

At the PLM you can perform the following manual aggregations. When performing manual aggregation actions the production must be running. Aggregation and deaggregation are fully traceable by storing dependencies of parent and child unit GTINs and serial numbers into the database.

Note

Finish manual aggregation before closing an order.

Do not finish an order before performing the manual aggregation. Production must be running when performing manual aggregation. Otherwise incomplete units being at the cache have to be discarded.

7.7.9.1 Destroying Parent Label (Reversing Aggregation, A-3.7.7.9.1)

It is possible to reverse the aggregation of a unit (pallet / case / bundle). In order to do this you have to "destroy" the unit label. The unit label is no longer useable and should be discarded. The child units/Items are thereby released and are assigned to the lower rank again.

To destroy a parent label, proceed as follows:

Press Home > Global hand scanner > show hierarchy > (Scan product with global hand scanner) > destroy (See the following figure)

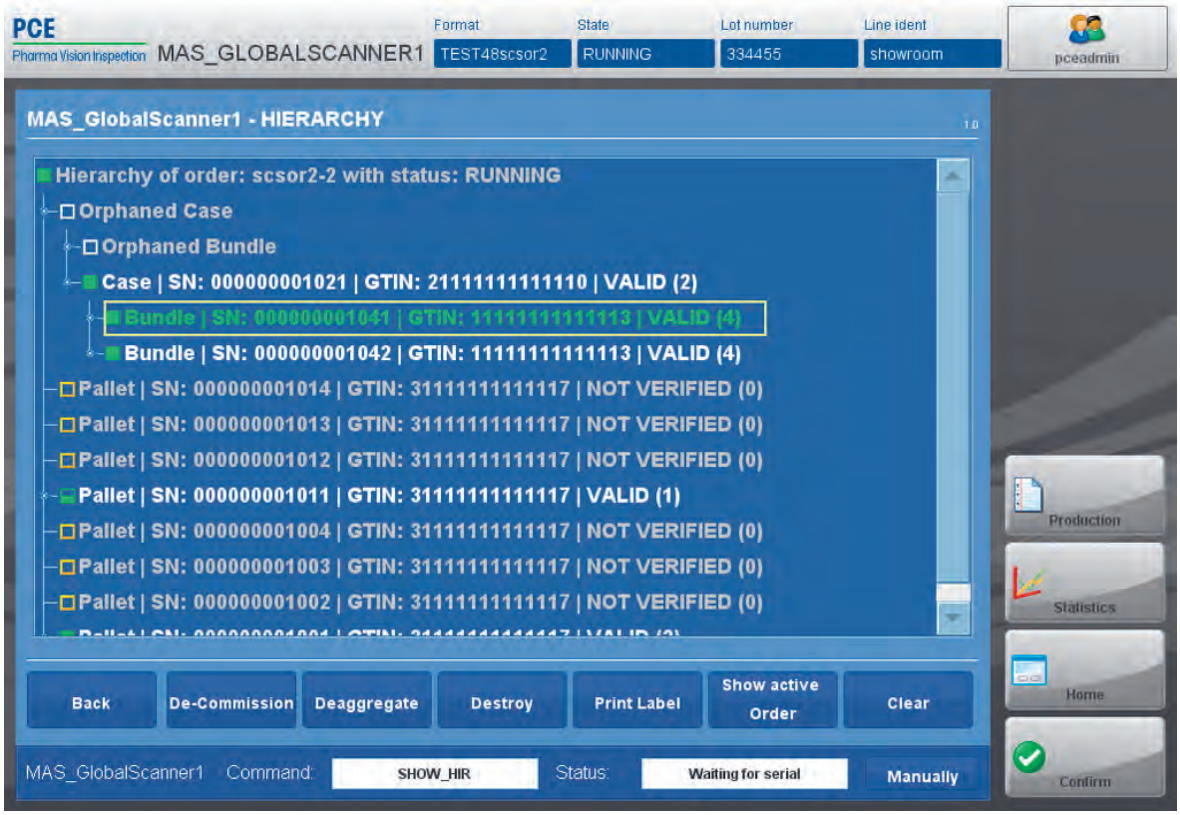


Figure: `Figure: Home > Global hand scanner > show hierarchy > (Scan product with global hand scanner)`

7.7.9.2 Deleting the Relation between Child Unit and Parent Unit (deaggregate) (A-3.7.7.8.2)

To delete the relation between a child unit and a parent unit (when deleting a **case from a pallet** or a **bundle from a case** or an **item from a bundle**) you have to deaggregate the child rank. Then the selected child unit is released (orphaned) and can be aggregated again. If a new parent label with GTIN / serial number is printed immediately or not, depends on the system settings of the PLM. To deaggregate a rank proceeds as follows:

Press `Home > (Select Global hand scanner) > Show hierarchy > (Scan unit or select unit within the hierarchy tree) > Deaggregate`

The unit gets orphaned but stays valid in the database.

7.7.9.3 Suspending an Order (A-3.7.7.8.3)

To suspend an order to continue it later proceeds as follows:

Press `Production > suspend.`

Production and batch are then suspended and can be continued. The order will stay suspended, even after shutdown and restart of the system you can continue the order.

Note: If you want to produce another order between suspend and continue of the order, you need a connection to the global database. If you only have connection to the local database (cache mode) it is not possible to produce another order in between.

7.7.9.4 Finishing an Order Before it is completed

To complete an order before the maximum number of items is reached proceed as follows:

Press `Production > finish.` Confirm with `Yes.`

The batch is then finished.

7.7.9.5 Commissioning and Decommissioning a Unit (A-3.7.7.8.5)

It is possible to commission or decommission a unit (item, bundle, case or pallet). When decommissioning, the serial number(s) will still be stored at the database but tagged as "invalid" and no longer usable. When decommissioning a parent rank the child ranks are also decommissioned but the relation between the units still exists.

To decommission a unit, proceed as follows:

Press `Home > Global hand scanner > show Hierarchy > (Scan unit with global hand scanner) > decommission`

To commission a unit, proceed as follows:

Press `Home > Global hand scanner > show Hierarchy > (Scan unit with global hand scanner) > commission (See the following figure)`

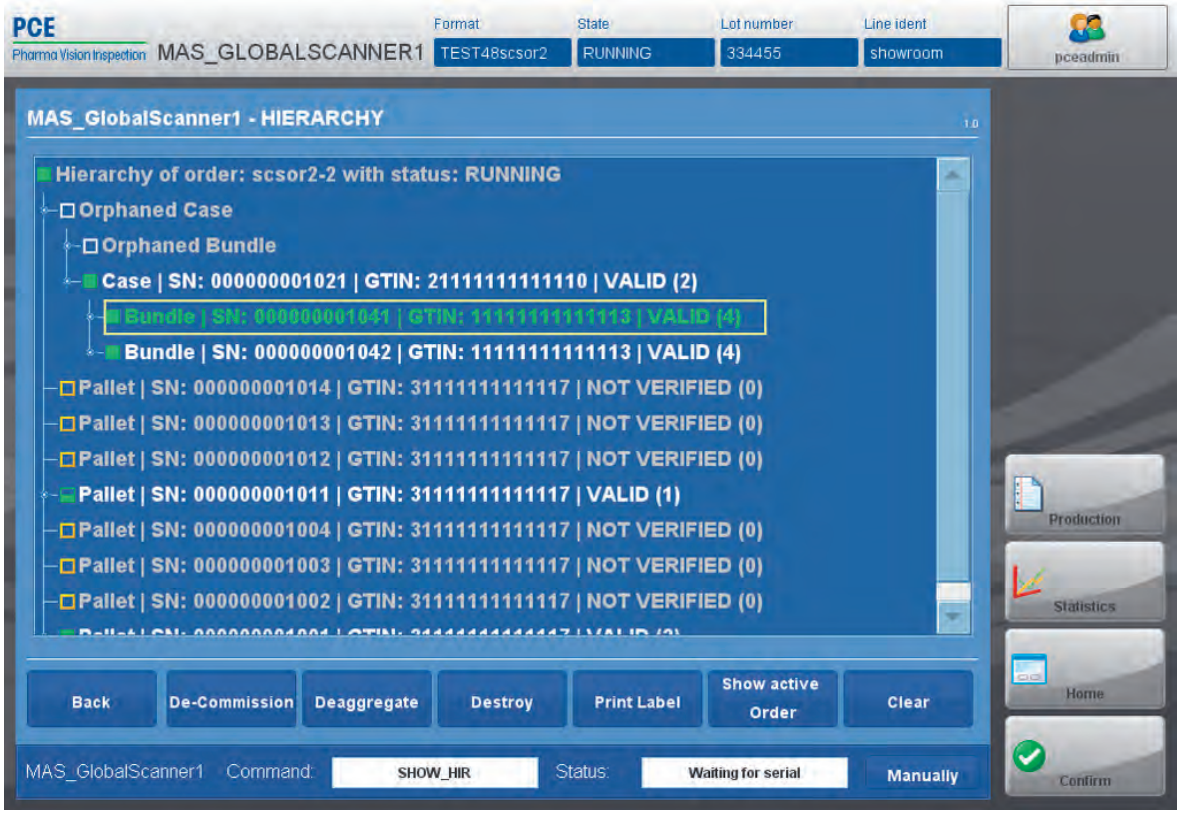


Figure: `Home > Global hand scanner > show hierarchy > (Scan product with global hand scanner)`

7.7.9.6 Closing an Incomplete Unit (partial case)

It is possible to complete a unit before max number of items is reached. To close a case during production is running, press `Home > global hand scanner > show aggregation > (choose rank) > Close`. The unit is then closed.

7.7.9.7 Viewing Aggregation Rank of a Unit (A-3.7.8.4)

To view the aggregation rank of a unit (item, bundle, case or pallet) proceed as follows:

Press `home > Global hand scanner > show hierarchy > (scan with global hand scanner)`. (See following figure)

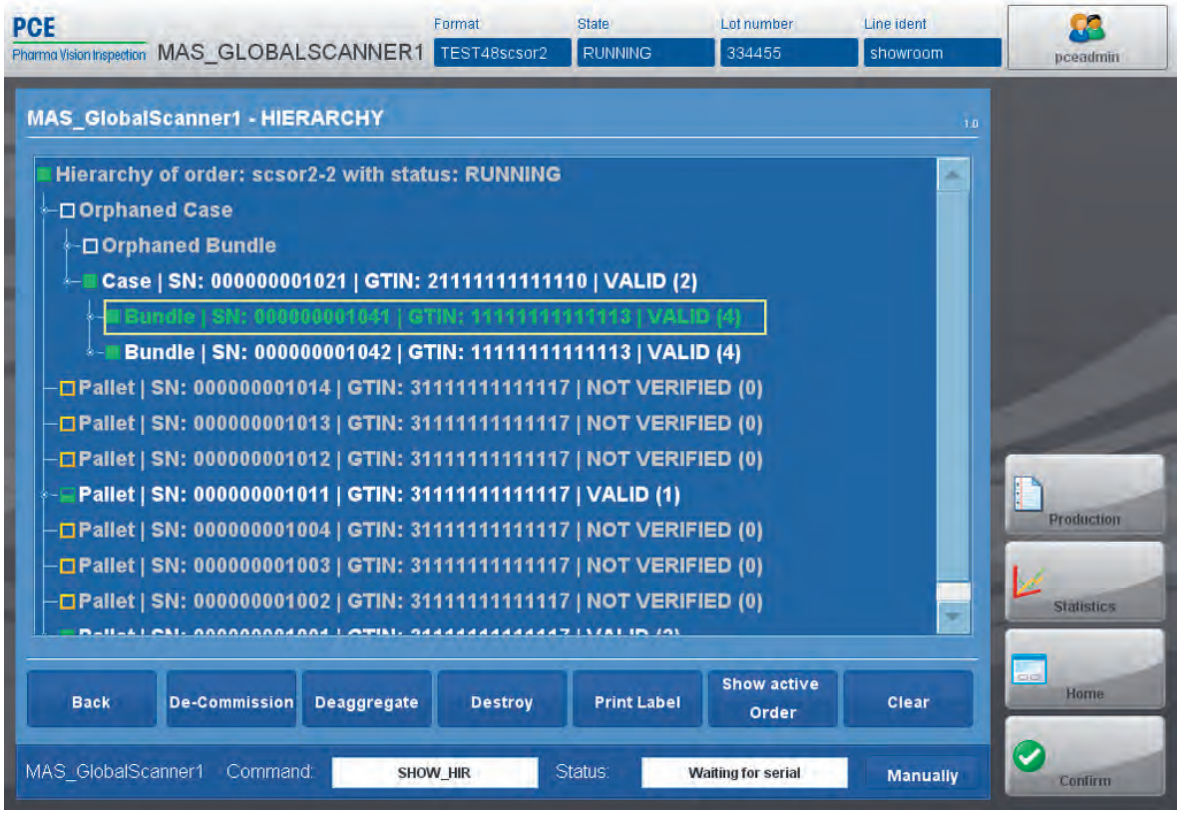


Figure: `Home > Global hand scanner > show hierarchy > (Scan product with global hand scanner)`

The rank is then displayed.

7.7.9.8 Re-printing a Label with same SN or Different SN (A-3.7.7)

You can re-print labels of the current batch for a bundle, a case or a pallet - with a different serial number or - with same serial number. How your re-print works has to be determined at the system settings. Go to `System Settings > Edit System Settings` and change the parameter 'Reprint new serial'.

To re-print a label, proceed as follows:

Press `Home > global hand scanner > show hierarchy > (scan or select product) > print label` (See following figure)

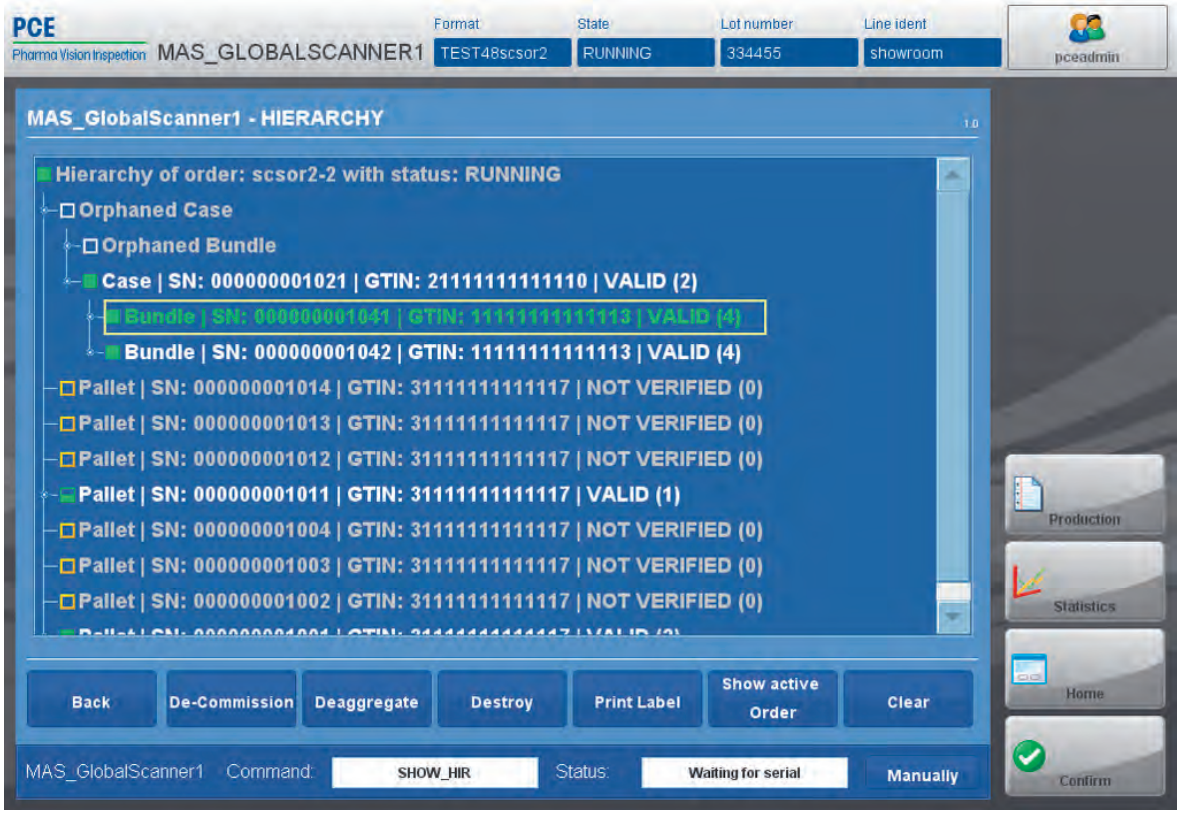


Figure: `Home > Global hand scanner > show hierarchy > (Scan product with global hand scanner)`

7.7.9.9 Handling Incomplete Units When Order is finished

If an order is finished (pressing `Finish` before or after quantity is reached) it depends on the printer settings how to handle uncompleted units. There are three possibilities to produce:

	Kind of Code	**Explanation**
a	Only GTINs, only complete units	When producing only with GTINs all incomplete units being at the cache are discarded.
b	GTIN for complete units, SSCC for incomplete units	When producing with GTINs and SSCC all incomplete units being at the cache get an SSCC number. Incomplete units have to be scanned to verify their aggregation and afterwards they have to be 'closed'.
c	Only SSCCs for complete and incomplete units	When producing only with SSCC all incomplete units being at the cache get an SSCC number. Incomplete units have to be scanned to verify their aggregation and afterwards they have to be 'closed'.

If a GTIN, a SSCC or both is printed, this can be defined at each rank individually. This has to be set in the printer settings at the line format. The needed AIs are:

- GTIN: 01-21
- GTIN+SSCC: 01-21-00
- SSCC: 00

At the field 'DMX' select ##DMX enter the AIs as follows:

Kind of Code	**AIs**
Only GTINs, only complete units	01-21
GTIN for complete units, SSCC for incomplete units	01-21-00
Only SSCCs for complete and incomplete units	00

7.7.9.10 Run Testorder with Imported GTIN (H-4.1)

1. Add GTIN Number for Rank1, 2 and 3.

2. Create a new Order (see chapter Adding a New Order (page 100))

3. Assign GTIN and Company Prefix to the order. Add a field for GTIN at the Order Details Dialog. (see chapter Adding Order Details (page 101))

Use Values:

- Rank 0: (Global) add R05 (Company prefix) with value "Text"
- Rank 1: (Item) add 01(GTIN) with GTIN for rank1, created in step 1)
- Rank 2: (Bundle) add 01(GTIN) with GTIN for rank2, created in step 1)
- Rank 3: (Case) add 01(GTIN) with GTIN for rank3, created in step 1)

4. Import GTIN ranges for all GTINs created in step one.

5. Run test order (see chapter Starting Production via Order > Test Run (page 106))

Use Values:

- Order: Use order (created in step 2).
- Serial number Generator: SGTINGenerator

6. Set Order State to '3 FINISHED' (see chapter Start / Stop Production (A-3.7.5) (page 105))

7. Export Order, Go to Management > Order Management > Order Export. Select order (created in step 2) and click Export.

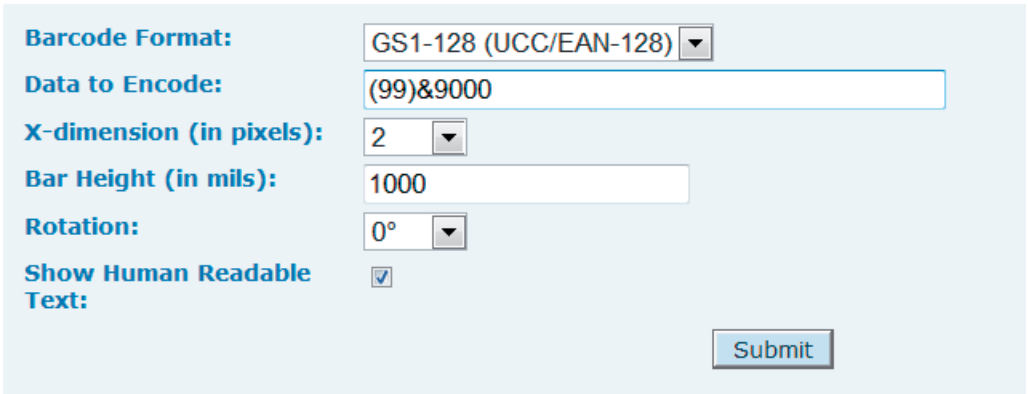
7.7.10 Manual Aggregation by Scanning a Barcode (H-2.9)

Manual aggregation actions can be performed faster by scanning a barcode that leads to the corresponding menu.

7.7.10.1 Creating a Barcode Command

It is possible to create a barcode individually via the website mentioned below.

1. Go to http://www.morovia.com/free-online-barcode-generator/



2. Select "GS1-128 (UCC/EAN-128)" within the field "Barcode Format".

3. Enter desired code of the following list (Example: "(99)&9000" for "Show information") within the field "Data to Encode".

4. Select desired x-dimension, bar height, rotation and if human readable text should be displayed.

5. Select "Submit".

7.7.10.2 List of Commands

The GS1 list of commands for barcodes contains a code for each data to encode in accordance with the GS1 Standard. Use a code to create barcode with the corresponding function.

Code GS1-128	Command	Rank
(99)&0000	Unknown	0
(99)&0001	Automode	0
(99)&0100	Add Unit	0
(99)&0111	Commission	0
(99)&0200	Add external	0
(99)&0400	Destroy	0
(99)&0500	Reprint Label	0
(99)&0900	Close Exist	0
(99)&0910	Verify Unit	0
(99)&0950	Deaggregate	0
(99)&0999	Decommission	0
(99)&9000	Show Information	0
(99)&9001	Show Aggregation	0
(99)&9002	Show Hierarchy	0
(99)&2000	Create Rank 2	2
(99)&2010	Open Exist Rank 2	2
(99)&2020	Open Child Rank 2	2
(99)&2100	Add Unit To Rank 2	2
(99)&2200	Add Ext To Rank 2	2
(99)&2900	Close Rank 2	2
(99)&2910	Close Exist Rank 2	2
(99)&2940	Remove Cache Rank 2	2
(99)&2950	Deaggregate Rank 2	2
(99)&3000	Create Rank 3	3
(99)&3010	Open Exist Rank 3	3
(99)&3020	Open Child Rank 3	3
(99)&3100	Add Unit To Rank 3	3
(99)&3200	Add Ext To Rank 3	3
(99)&3900	Close Rank 3	3
(99)&3910	Close Exist Rank 3	3
(99)&3940	Remove Cache Rank 3	3
(99)&3950	Deaggregate Rank 3	3
(99)&4000	Create Rank 4	4
(99)&4010	Open Exist Rank 4	4
(99)&4020	Open Child Rank 4	4
(99)&4100	Add Unit To Rank 4	4
(99)&4200	Add Ext To Rank 4	4
(99)&4900	Close Rank 4	4
(99)&4910	Close Exist Rank 4	4
(99)&4940	Remove Cache Rank 4	4
(99)&4950	Deaggregate Rank 4	4
(99)&5000	Create Rank 5	5
(99)&5010	Open Exist Rank 5	5

(99)&5020	Open Child Rank 5	5
(99)&5100	Add Unit To Rank 5	5
(99)&5200	Add Ext To Rank 5	5
(99)&5900	Close Rank 5	5
(99)&5910	Close Exist Rank 5	5
(99)&5940	Remove Cache Rank 5	5
(99)&5950	Deaggregate Rank 5	5
(99)&6000	Create Rank 6	6
(99)&6010	Open Exist Rank 6	6
(99)&6020	Open Child Rank 6	6
(99)&6100	Add Unit To Rank 6	6
(99)&6200	Add Ext To Rank 6	6
(99)&6900	Close Rank 6	6
(99)&6910	Close Exist Rank 6	6
(99)&6940	Remove Cache Rank 6	6
(99)&6950	Deaggregate Rank 6	6
(99)&7000	Create Rank 7	7
(99)&7010	Open Exist Rank 7	7
(99)&7020	Open Child Rank 7	7
(99)&7100	Add Unit To Rank 7	7
(99)&7200	Add Ext To Rank 7	7
(99)&7900	Close Rank 7	7
(99)&7910	Close Exist Rank 7	7
(99)&7940	Remove Cache Rank 7	7
(99)&7950	Deaggregate Rank 7	7
(99)&8000	Create Rank 8	8
(99)&8010	Open Exist Rank 8	8
(99)&8020	Open Child Rank 8	8
(99)&8100	Add Unit To Rank 8	8
(99)&8200	Add Ext To Rank 8	8
(99)&8900	Close Rank 8	8
(99)&8910	Close Exist Rank 8	8
(99)&8940	Remove Cache Rank 8	8
(99)&8950	Deaggregate Rank 8	8

7.7.10.3 Commonly used Barcodes

Show Information (99)&9000	Decommission (99)&0999
Show Aggregation (99)&9001	Commission (99)&0111

Show Hierarchy 	Deaggregate
Verify Unit 	Reprint Label
Add Unit 	Destroy

7.8 Troubleshooting

7.8.1 Treating Products after an Interruption

When an error makes a product unusable e.g. squeezed packaging, proceed as follows:

Serialized products: Check all printed products you wish to discard with a hand scanner. Serialized products have to be "decommissioned" (see chapter 7.7.9.5 (page 125))

Unprinted products: When a product is not yet printed you can discard it without scanning it.

Not scanned products: If a product is printed but not scanned you can discard it without scanning it.

7.8.2 Avoiding Waste of Items after an Interruption

At the serialization process, the PLM sends a serial number to the printer. The printer prints the serial number and the PLM sends the same serial number to the reader (camera, RFID reader,…) which validates it. The sequence of printed serial numbers has to be consistent with the sequence of read serial numbers. If the production is interrupted and the conveyer has been stopped, there are always some items between printer and reader which have to be discarded because their serial numbers were deleted from the PLM cache, so they will not be sent to the camera for validation after restart.

The ″use wildcard″ function allows continuing the production after interruption without having to discard the left items. This is done by checking only the attendance of a serial number without validating it. Validation is then done by the PLM.

7.8.2.1 Use Wildcards globally for all Line Formats

Note

'useWildcards' is only for serialized products

The 'useWildcards' feature is only applicable for serialized products. This feature is not applicable for standard print verification or aggregation verification.

If you wish to use the wildcard feature generally for all line formats of a line, activate the 'useWildcards' function at the system settings of the reader. See figure below:

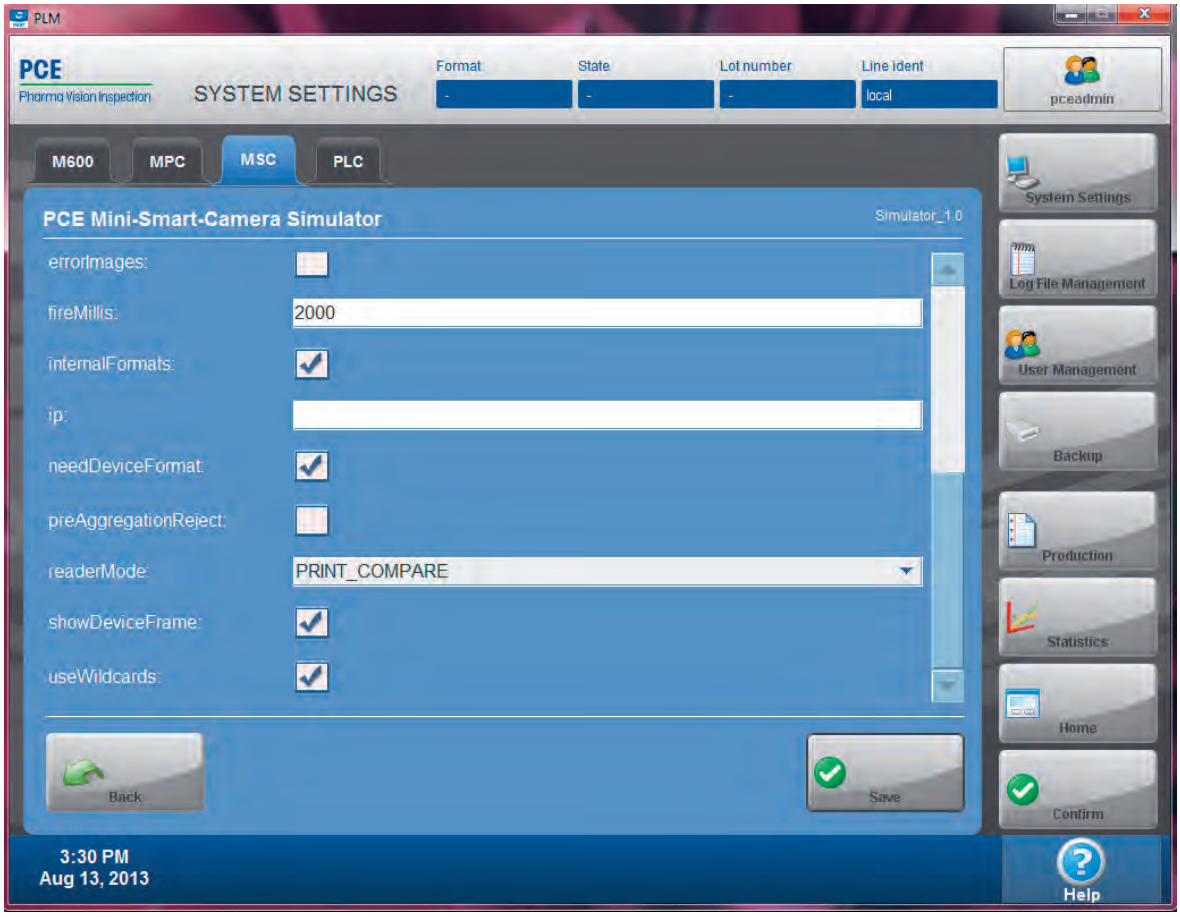


Figure: `System Settings > Edit device settings > (Select Reader) > Set checkmark at "use Wildcards", press Save`

Thus, whenever the reader is activated it will use wildcards for the serial number. The length for the serial number has to be defined in the order or in the product at the Application Identifier 'R03, SER LENGTH'.

7.8.2.2 Use Wildcards Line Format specific

If you wish to use the wildcard feature only for an individual line format, not for all line formats, you have to enter asterisks (*) as wildcards into the field for serial numbers at the line format. Put these asterisks into the serial number field instead of the serial number. Go to the following screen:

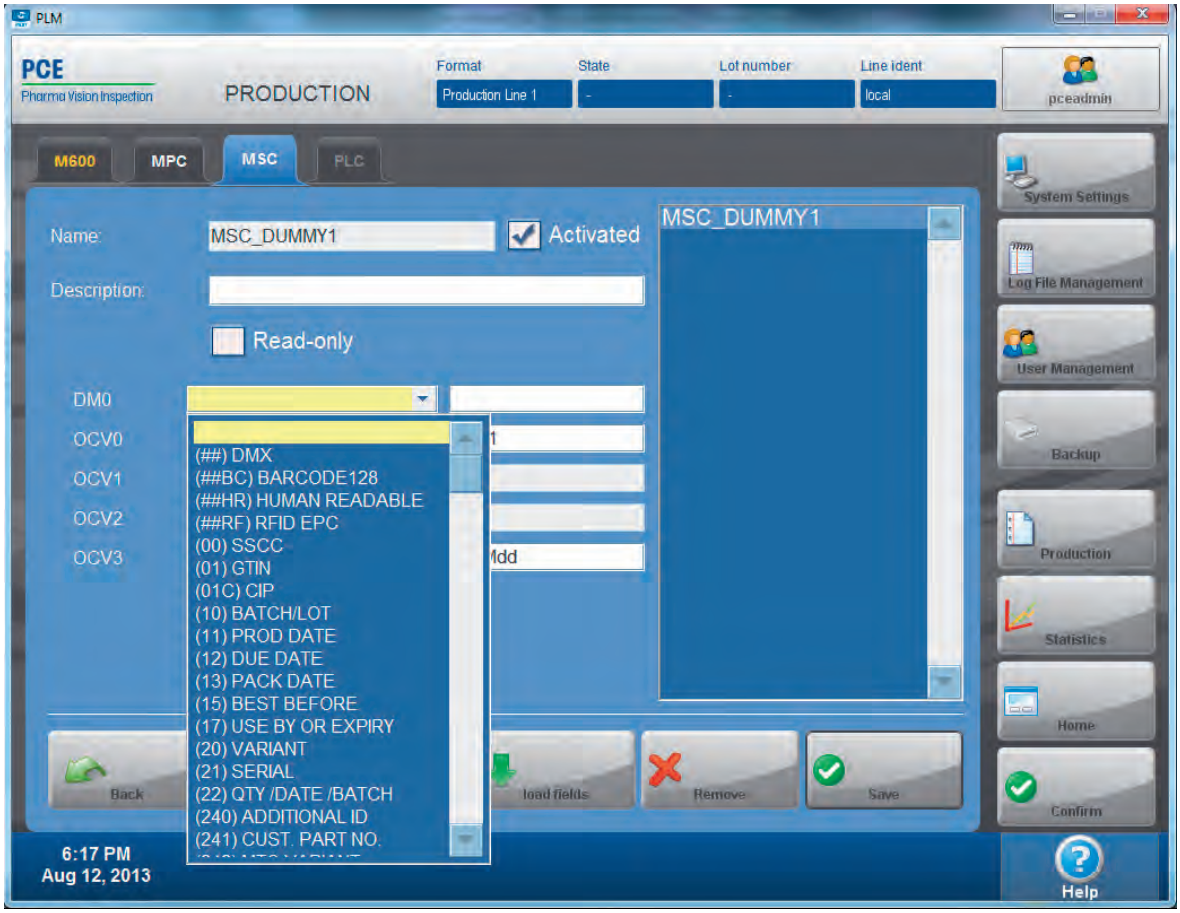


Figure: Production > Add/Edit line format > (Select line format) > Devices > (select reader) > (set checkmark at the 'Activated' field) > (Select empty field at DM0)

Select the empty entry (first entry) at the first column next to the field for the serial number (in the example 'DMO'). At the second column, enter asterisks for the serial number as wildcards:

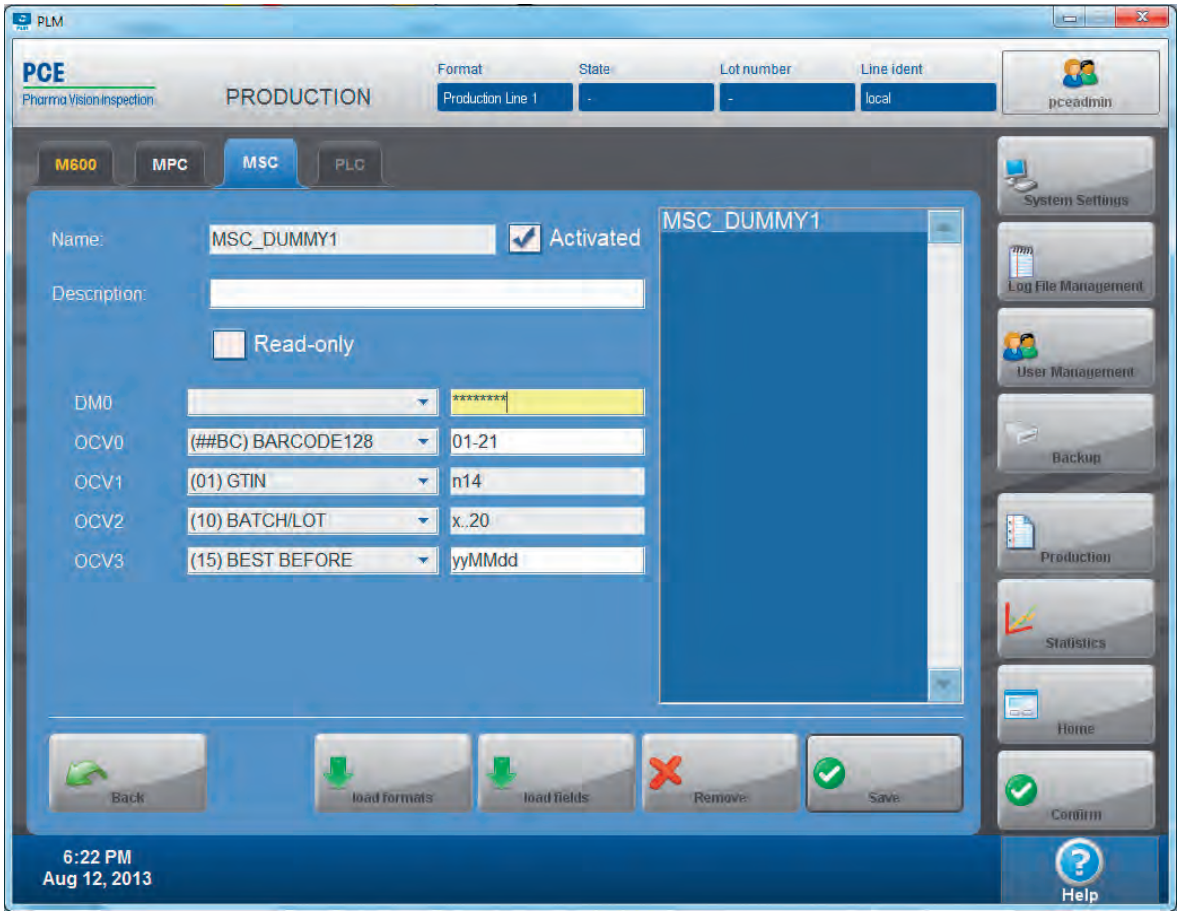


Figure: `Production > Add/Edit line format > (Select line format) > Devices > (Select empty field) > Enter asterisks`

Enter as many asterisks as long the serial number is. E.g. for an 8-digit serial number enter 8 asterisks. Press Save to save the settings.

When producing with this line format, only the attendance of a number with the right length (In the example 8 digits) is checked by the camera.

Wildcard for SN in Code with several AIs

If there is a code containing several AIs, including the serial number; for the serial number wildcards can be used. Code fields are the fields with a double hash (#) in front of it:

(##) DMX

(##BC) BARCODE 128

(##HR) HUMAN READABLE

(##RF) RFID EPC

Example:

AIs to check at the DMX Code	Input into the DM0 field	Meaning
GTIN (01); SERIAL (21); USE BY OR EXPIRY (17); BATCH/LOT (10)	01-21 (********)-17-10	Eight Asterisks behind the AI21 means the serial number is eight characters long.

In the example above, the fields 01; 17 and 10 are checked. The serial number (21) can be variable but is checked to be 8-digit.

7.8.3 HRC Offset is too large

Indication / Error Message:

The screen at the **HRC** software from ABS looks as shown below.

Description:

The bundle image at the ABS is made by a **HRC** which takes multiple photos in sequence that are put together by the camera software. If the offset is too large the photo at the screen will look something like the following:

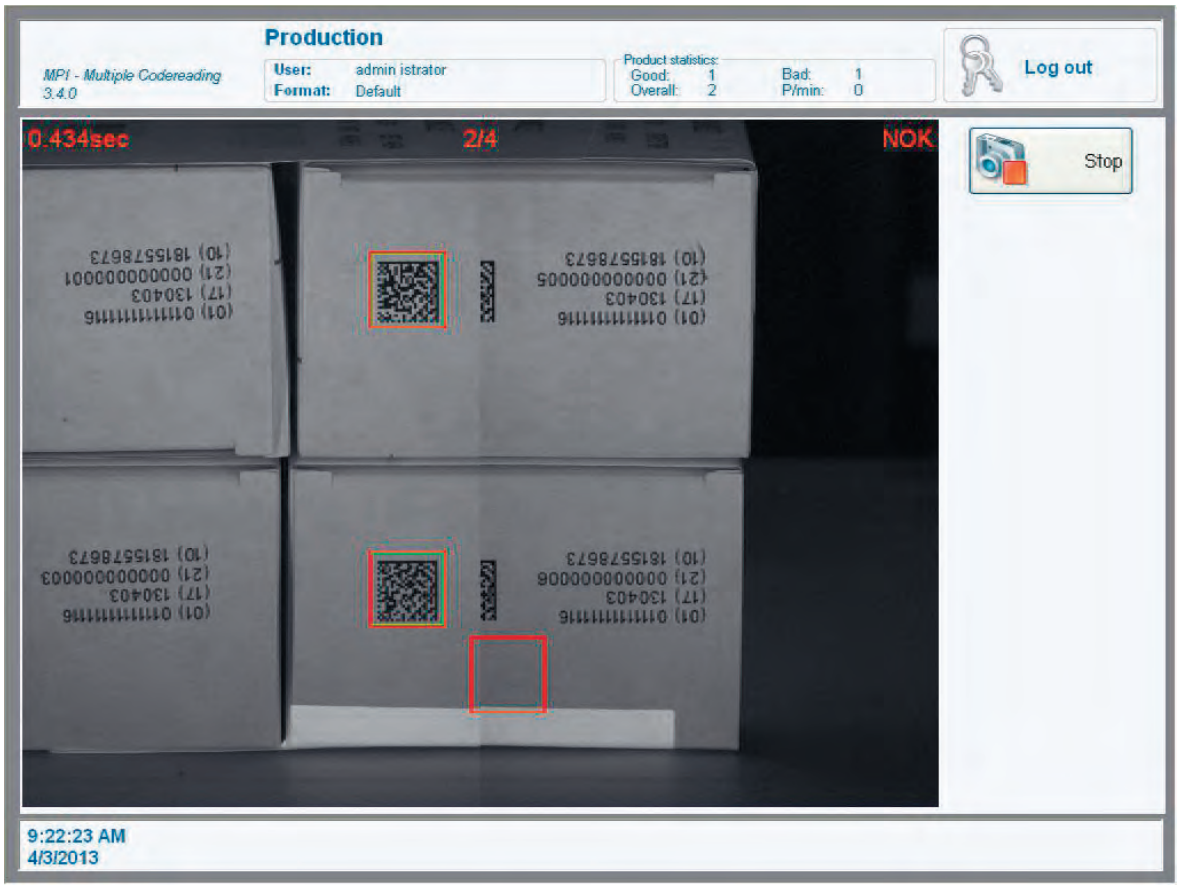


Figure: `Offset is too large`

At the screen the first photo is displayed at the left and the second photo is displayed at the right. The bundles move from the right to the left (point of view of the camera). At the left (first photo) the first two items are cut and the code of the second two items is captured. At the right (second photo) the second two items are cut.

Solution:

Both items have to be centered at the screen. Decrease offset of the **HRC**.

Action:

Press `Production > Add/Edit Line Format > ABS PLC`

Estimate offset (in mm) on basis of the screen photo. Subtract offset from the actual value at the 'offset' field and enter lower value. Start production and test the new offset. If necessary, repeat these steps till items are at the screen.

Figure:Offset is good

7.8.4 Printer Offset is too Large / Small

Indication / Error Message:

Label is protruding from the bundle.

Description:

The printer of the ABS applies the label on the bundle. If the offset is too small, the label is tagged to early on the bundle; if it is too large the label is tagged too late on the bundle.

Solution:

The label has to be centered at the bundle.

Action:

Press `Production > Add/Edit Line Format > Choose line format > Devices > (Select ABS PLC)`

Estimate offset (in mm). Subtract offset from the actual value at the 'offset' field and enter new value. Start production and test the new offset. If necessary, repeat these steps till bundles are centered at the screen.

7.8.5 Ejector Offset is too Large / Small

Indication / Error Message:

Ejection of erroneous bundle is triggered too early / too late.

Description:

Bundles with erroneous labels are ejected automatically by the ejector. If the ejector is triggered too early / too late the ejection can fail.

Solution:

The ejector offset has to be adjusted to the right value.

Action:

Press `System settings > edit device settings > ABS PLC > Teach`

Estimate offset (in mm). Subtract offset from the actual value at the field 'Offset Eject' and enter new value.

Start production and test the new offset. If necessary, repeat these steps till ejection works properly.

7.8.6 Scanner Offset is too Large / Small

Indication / Error Message:

Camera and printer offset are adjusted correctly but the bundle is ejected after reading. At the ABS scanner the LED lights red instead of green.

Description:

If the scanner offset is too large, scanning of the label is performed to late; if it is too small, scanning of the label is performed to early. The label will not be captured and ejected.

Solution:

The scanner offset has to be adjusted to the right value.

Action:

Press `Production > Add/Edit Line Format > ABS PLC`

Estimate offset (in mm). Subtract/add offset from/to the actual value at the 'offset' field and enter lower/higher value. Start production and test the new offset. If necessary, repeat this procedure till scanning is done correctly, the LED lights green, the bundle is not ejected.

7.8.7 "Processing Timeout" at the MPI Software (SCS)

Indication / Error Message:

After taking an image with the **HRC** at the SCS an error message is displayed: "Processing Timeout". See the following figure:

Figure: `Error Message: "Processing timeout"`

Description:

Camera needs more time to analyze the image than timeout is set to. Factors are:

- Sequence of analysis of the image
- Timeout value
- Size of analyzed frame

Solution / Action:

Position case at the lower right of the analyzed frame

- Option: The MPI software starts analyzing the image at the lower right and ends analyzing at the upper left. Positioning the case at the lower right can accelerate the reading. See the following figure:

Figure: `Positioning items at the lower right`

- Result: Relevant areas are analyzed earlier, timeout is not reached.
- Action: Position the case at the lower right of the analyzed frame.
- Note: This refers to the analyzed area of the screen image this may be only a part of the whole screen if the frame is set this way. Refer to the MPI software manual ("Select part Image" function).

Change size of the analyzed frame

- Option: Change size of the analyzed frame if the current area is larger than the needed area.
- Result: Camera software needs less to analyze, timeout is not reached.
- Action: Position the items at a suitable position and set frame at the MPI software. Switch to the MPI software interface and press `Camera menu -> Log on > Stop> Tolerances > camera settings > Select Image part (set window around the case position)` Also refer to the MPI software manual ("Select part Image" function).

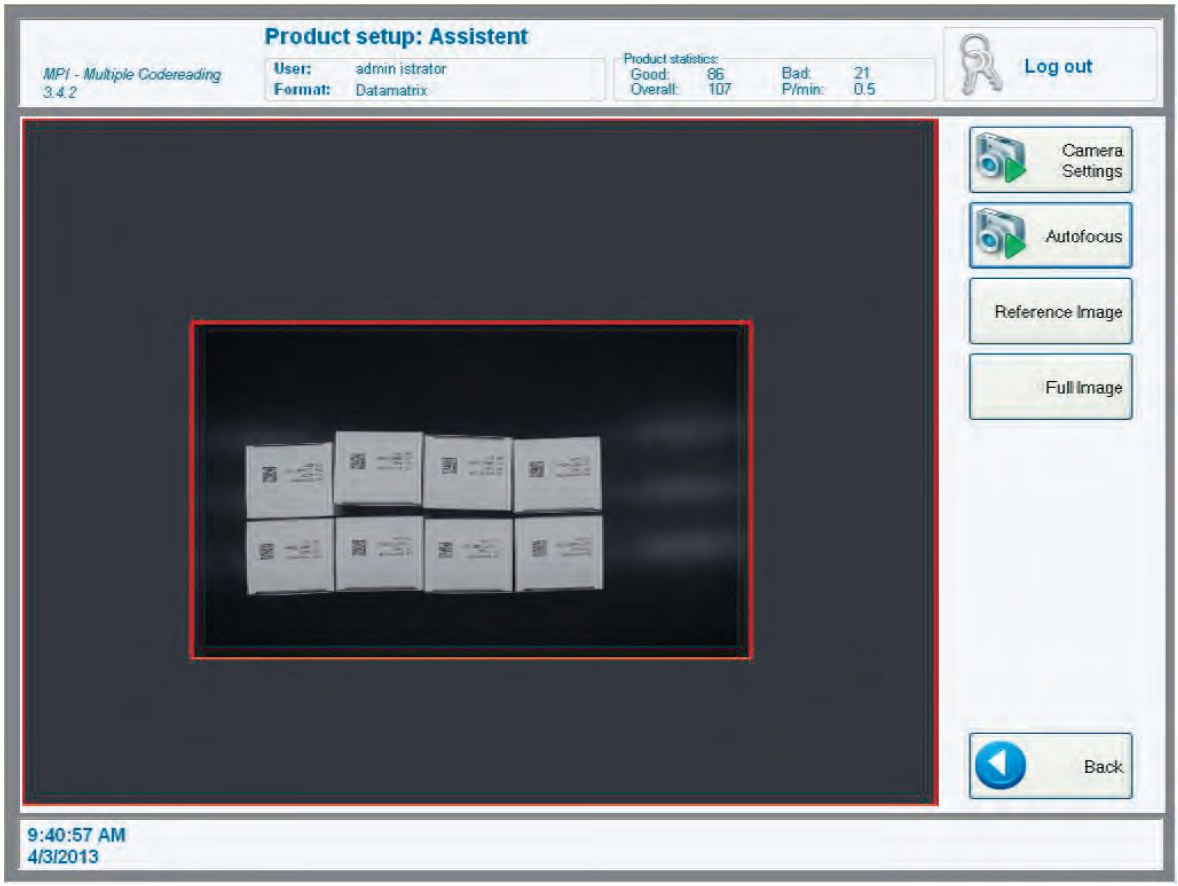


Figure: Set frame of the analyzed area

When taking a new picture the screen will show only the analyzed area and looks as follows:

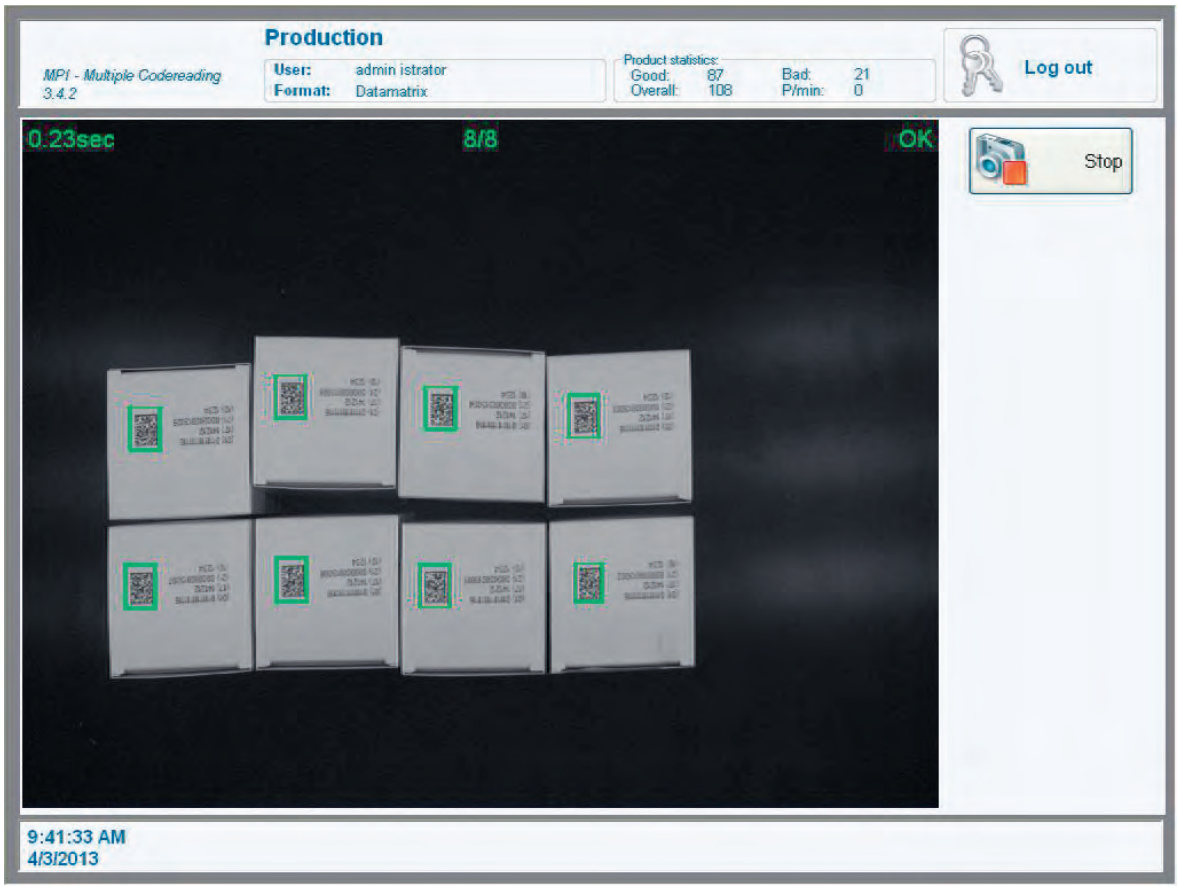


Figure: Frame of the analyzed area

Change timeout

- Option: Change timeout to a higher value if production speed allows this.
- Result: Analyzing time is below timeout, timeout is not reached.
- Action: Refer to the MPI software manual.

7.9 Device Options during Production (A-3.7.9)

During Production the `Home` screen (press `Home`) provides an overview of the available devices as visual presentation of the shift register (see below). From this screen you get to the device settings menus. For this press the corresponding bars. The screens of the devices and their usage are described in the following chapters. The following figure shows the `Home` screen:

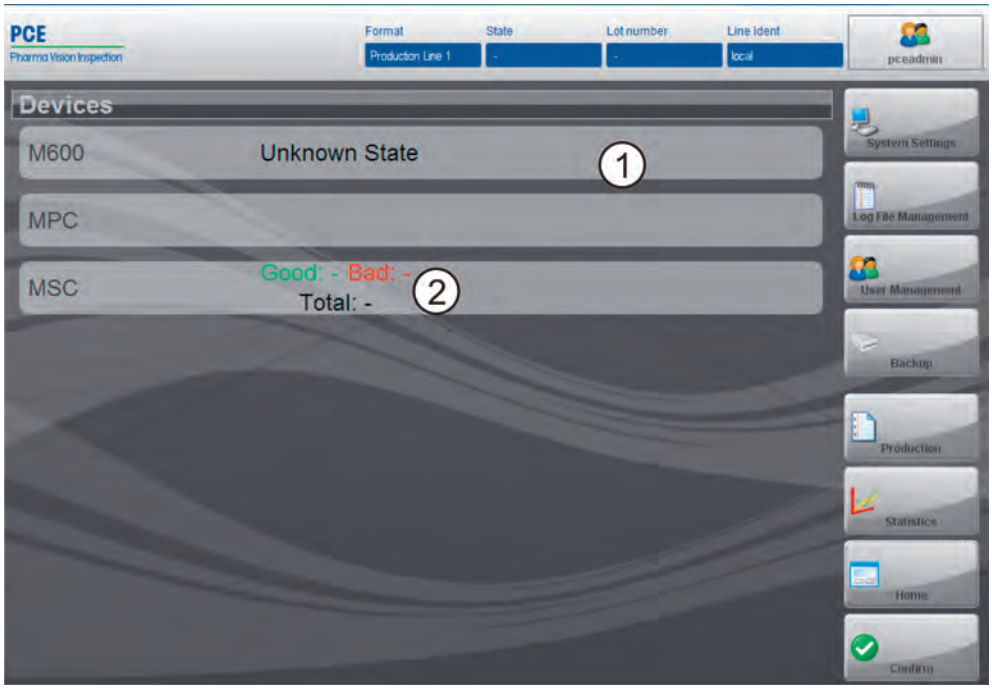


Figure: `Home (while production is running)`

Pos.	Name	Function
1	Device Status Bars	The main menu of the Pilot Line Manager always remains visible. All operating elements available are displayed in order to be able to change between the program functions (depending on the authorization level of the user
2	Counters	(Good/Bad/Overall) counters of the devices attached

Note

Refer to the operating instructions of each device

For the complete functional range of the individual devices please refer to the respective operating instructions.

7.9.1 Smart Camera

Class name: PCE_MSC

The PCE image processing system is operated using simple menu navigation on the display and with the integrated touch screen. The areas to be inspected are marked and verified using the window technique; operating instructions are displayed for the single products. The fields defined in the camera are used in the line format.

Note

Getting to the main menu

When the system is switched on, the production run – the actual evaluation mode is started. To get to the main menu of the camera, select the camera, press MENU and quit the production run.

From the camera main menu you can edit all smart camera settings (See Smart Camera operating manual).

Figure: Home > Smart Camera

For setting the control windows (OCV, OCR, Code, etc.) see chapter 6.2.8.3 (page 54).

7.9.2 Check of Serial Number (A-3.7.9.2)

Reading numbers and checking is done by the camera. Every individual serial number is checked against the pattern by the camera. If a serial number does not fit to those commissioned in the system, an error message is send to the PLM.

7.9.3 High Resolution Camera (HRC)

This screen shows the results of the **HRC** and is for display purposes only.

Figure: `Home > Megapixel Camera (during production)`

If you would like to use the **HRC**, press `MPI` in the main menu.

Switch from PLM to **HRC-AI Software** using the switch button.

7.9.4 Hand Scanner (A-3.7.9.4)

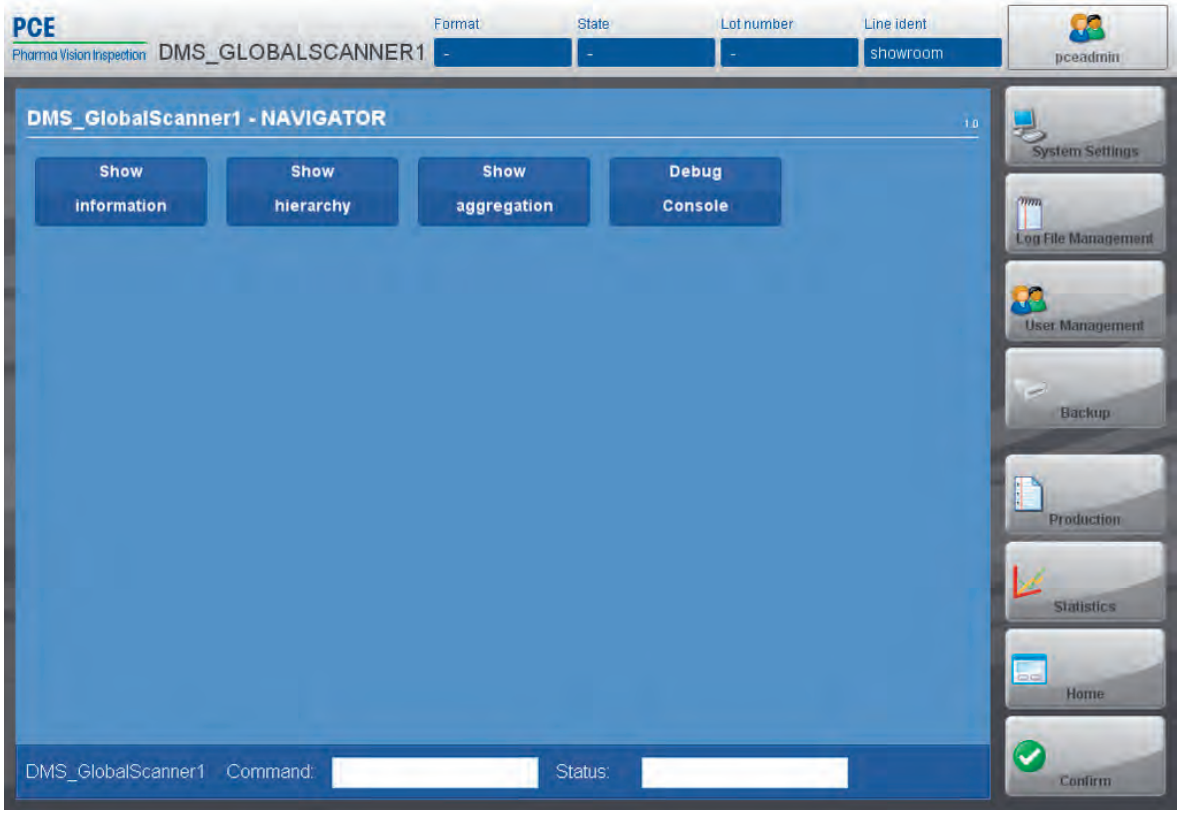


Figure: `Home > hand scanner (during production)`

Class name: Honeywell_Scanner

With the buttons at the upper part of the screen you can call up the corresponding functions as described below.

This table gives an overview of the functions:

Name	Function
Show information	View the code read by the hand scanner
Show hierarchy	View the classification of the read codes from the current job in a tree view
Show aggregation	View the already carried out aggregation within the current aggregation step
Debug console	View an analysis of read-in codes (The `debug console` button is only visible if under system settings at the parameter 'debugMode' a checkmark is set.

7.9.4.1 Show Information

Press `Show information` in order to show the code read by the hand scanner.

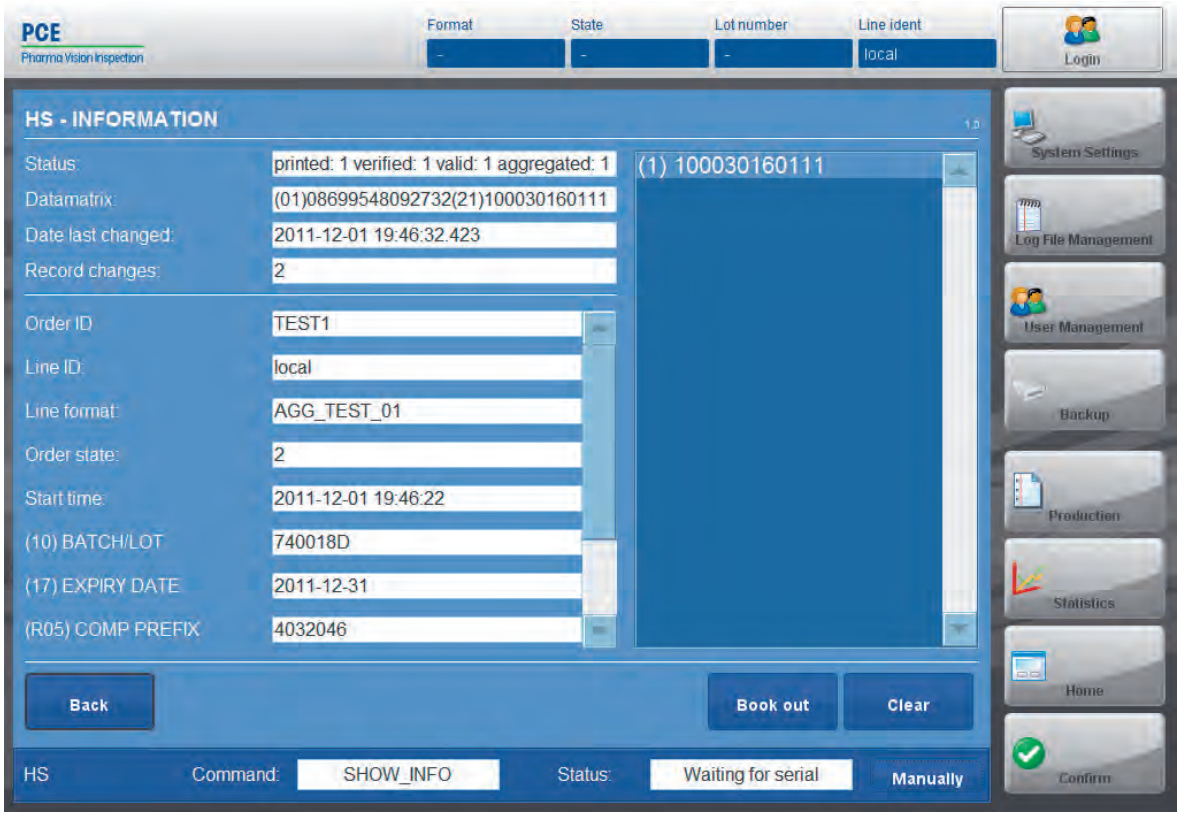


Figure: Home > hand scanner > Show information (during production)

7.9.4.2 Show Hierarchy

Press Show hierarchy at the Hand scanner navigator screen and scan a product to show the classification of the read codes of the current job in a tree view.

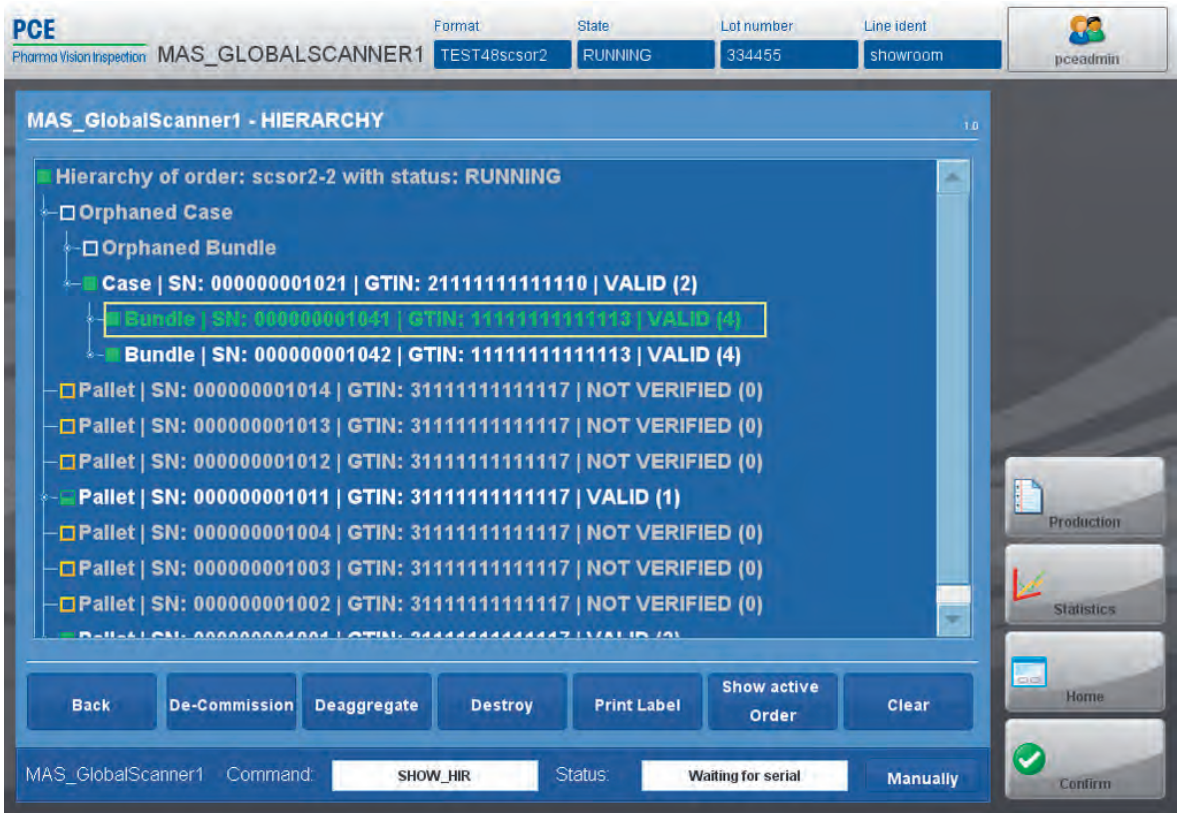


Figure: Home > hand scanner > Show hierarchy (during production)

The colors of the serial number bullets have the following meanings:

- **White:** valid serial number
- **Yellow:** serial number not verified by the camera
- **Red:** derecognized serial number by the hand scanner

You can call up any job name from the database by pressing `enter order name` and entering the order name. You can also scan a data matrix code by hand scanner to get information about its hierarchy. Press `clear` to reset the display.

7.9.4.3 Show Aggregation

Press the `show aggregation` in order to show the already carried out aggregation within the current aggregation step.

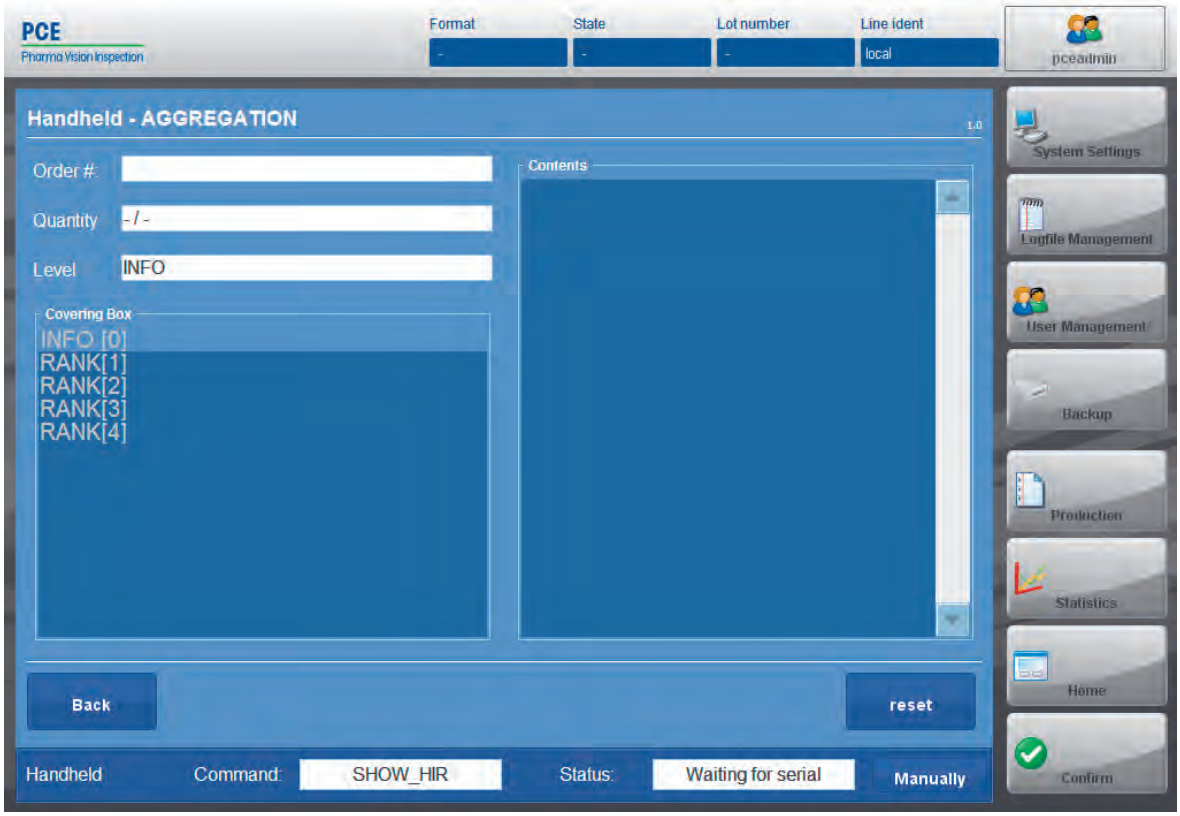


Figure: `Home > hand scanner > Show aggregation (during production)`

Press `reset` to set back the display and then from this point in time, newly aggregated serial numbers are displayed.

7.9.4.4 Debug Console

The debug surface enables analysis of read-in codes. The `debug console` button is only visible if under system settings at the parameter 'debugMode' a checkmark is set.

7.9.5 Wolke Printer Menu during Production

The `Printer menu` of the Wolke printer provides the following options:

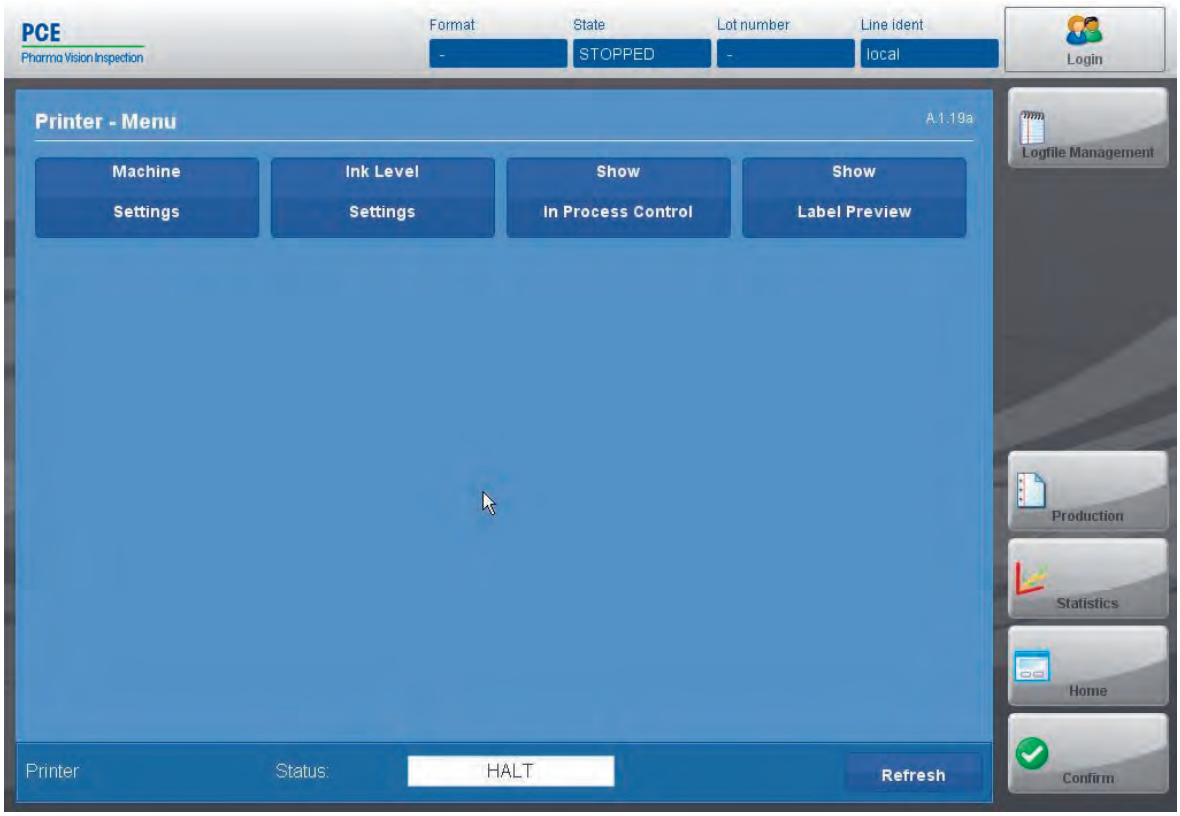


Figure: Home > Wolke Printer (during production)

Class name: Wolke_M600

Service keys:

- Machine settings
- Ink settings
- In Process Control
- Label display

7.9.5.1 Machine Settings

Here you get Information about the settings of the Wolke printer.

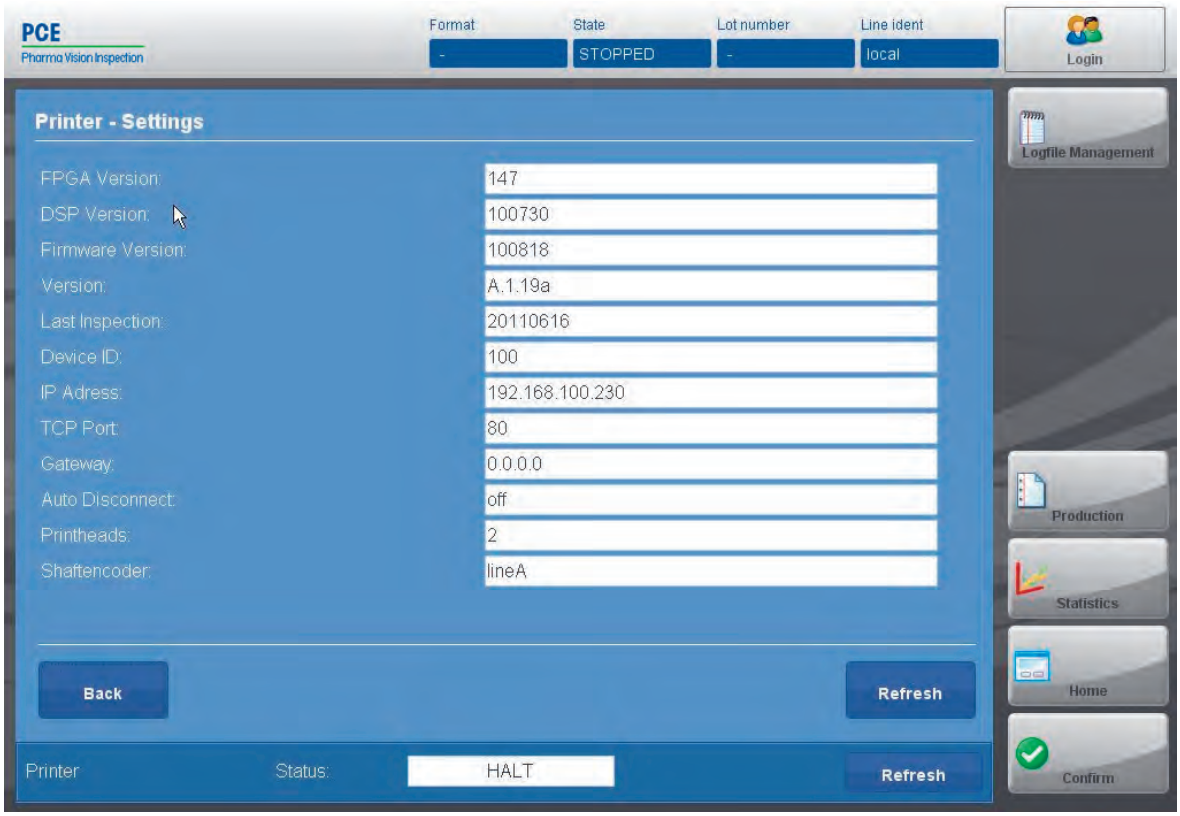


Figure: Home > Wolke Printer > Machine Settings (during production)

7.9.5.2 Ink Level Settings

This Menu displays the printer settings (Wolke Printer). Settings can be configured. This screen displays the ink levels of the print heads. The ink level display can be set back to 100% with Reset Ink Levels when the cartridge is changed.

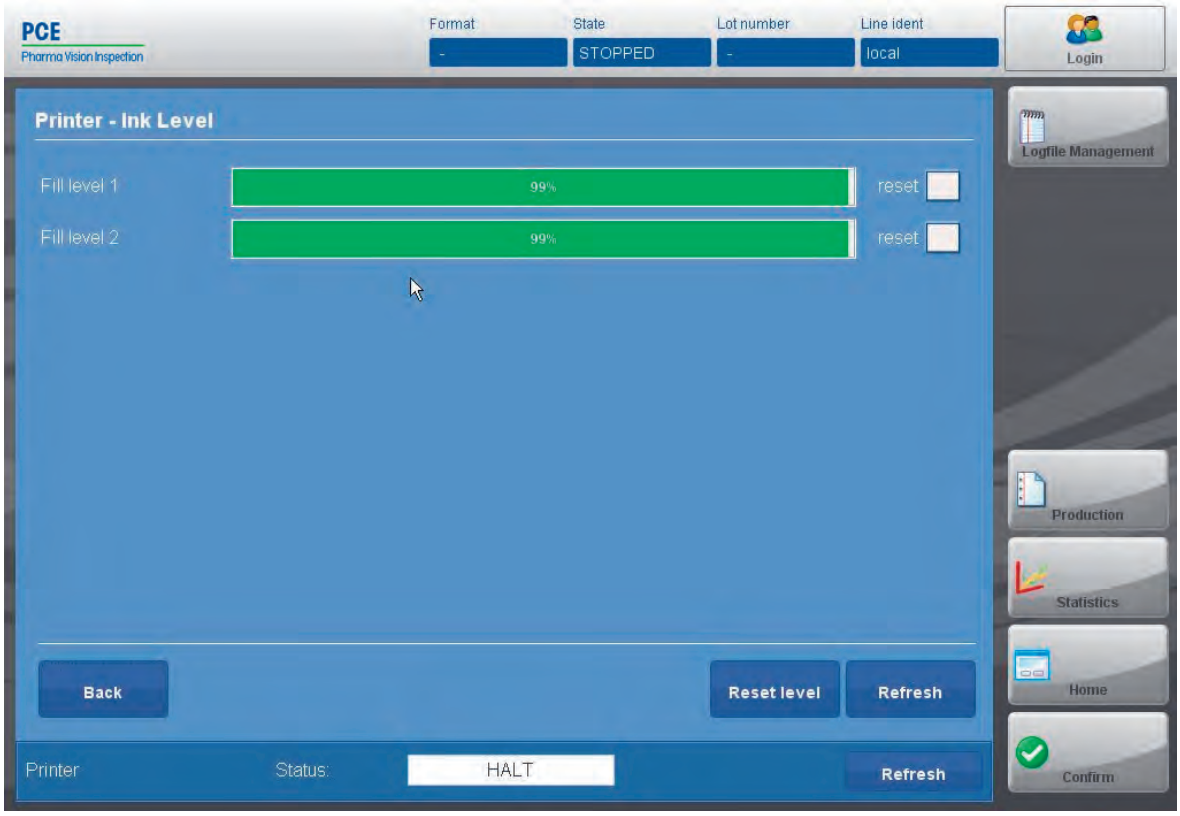


Figure: Home > Wolke Printer > Ink Level Settings (during production)

7.9.5.3 Cleaning Wolke-Cartridges

It is possible to clean the cartridges of the Wolke printer without clearance of machinery. Proceed as follows:

During production is running press `Production > Suspend`. Remove, clean and insert the cartridge (see: Wolke printer operating manual). After cleaning you can start production again.

7.9.5.4 Show in Process Control

During production the discharge mechanism of the Wolke printer can be tested at this menu.

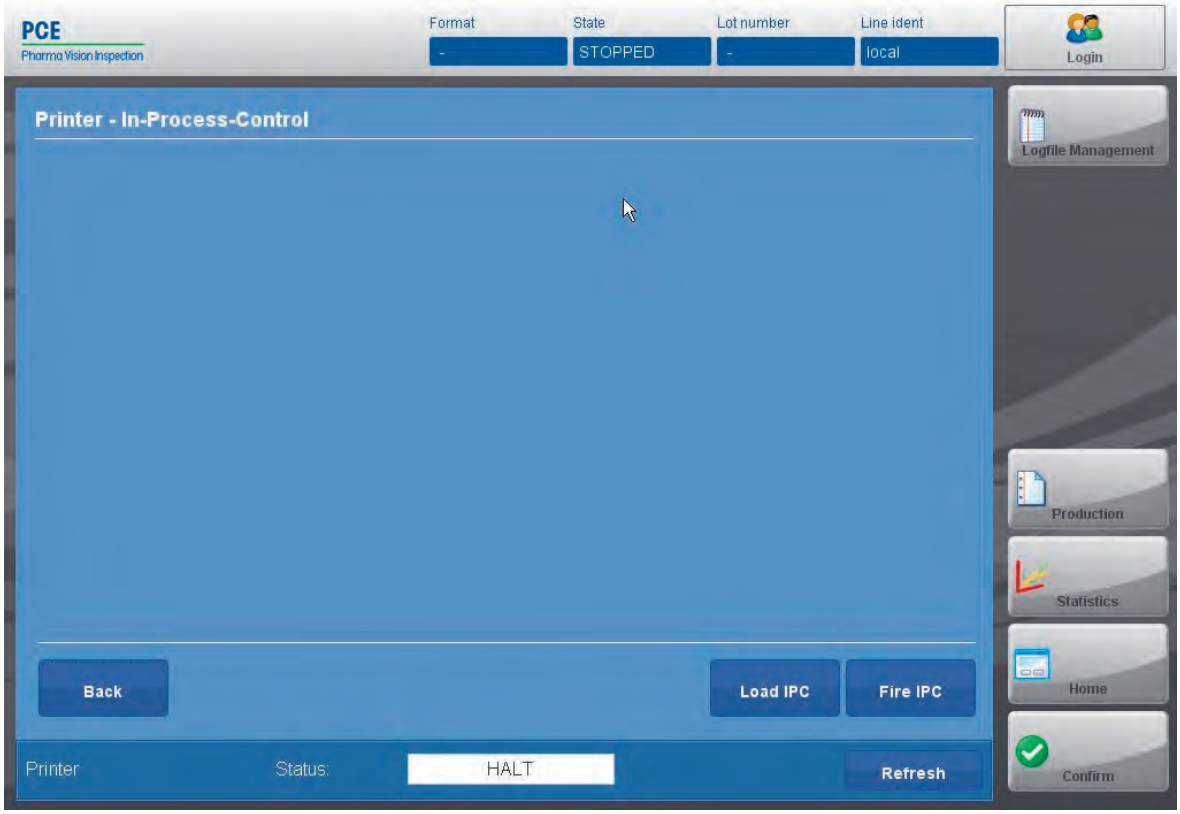


Figure: `Home > Wolke Printer > Show in Process Control (during production)`

At this screen you have the following options:

- Load IPC: Desired printout manipulation (e.g. print „B" rather than „8") is possible.
- Trigger IPC: With a folding box, the printout remains empty.

7.9.5.5 Label Preview

The label of the selected printer format is displayed. Fields surrounded by green are variable, grey fields are fields not used.

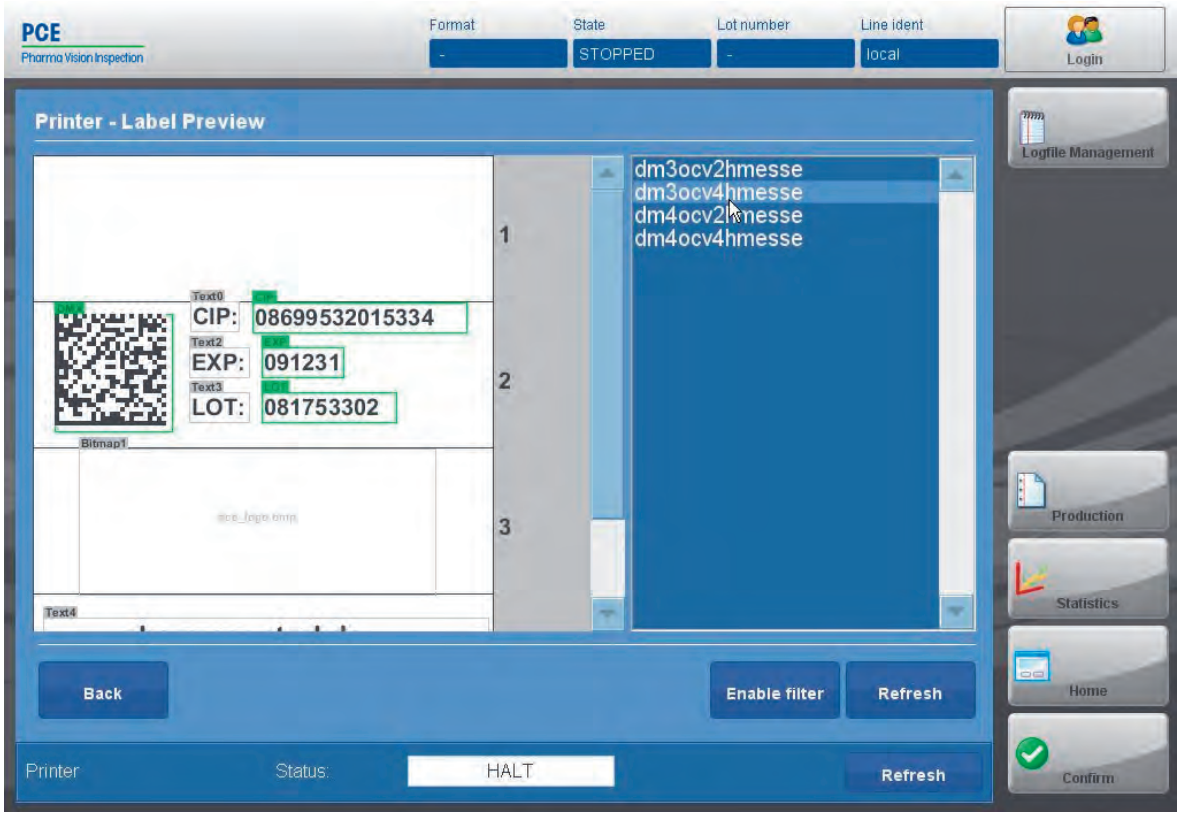


Figure: Home > Wolke Printer > Show Label Preview (during production)

7.9.6 Domino Printer Menu

The domino printer menu while production is running looks as follows:

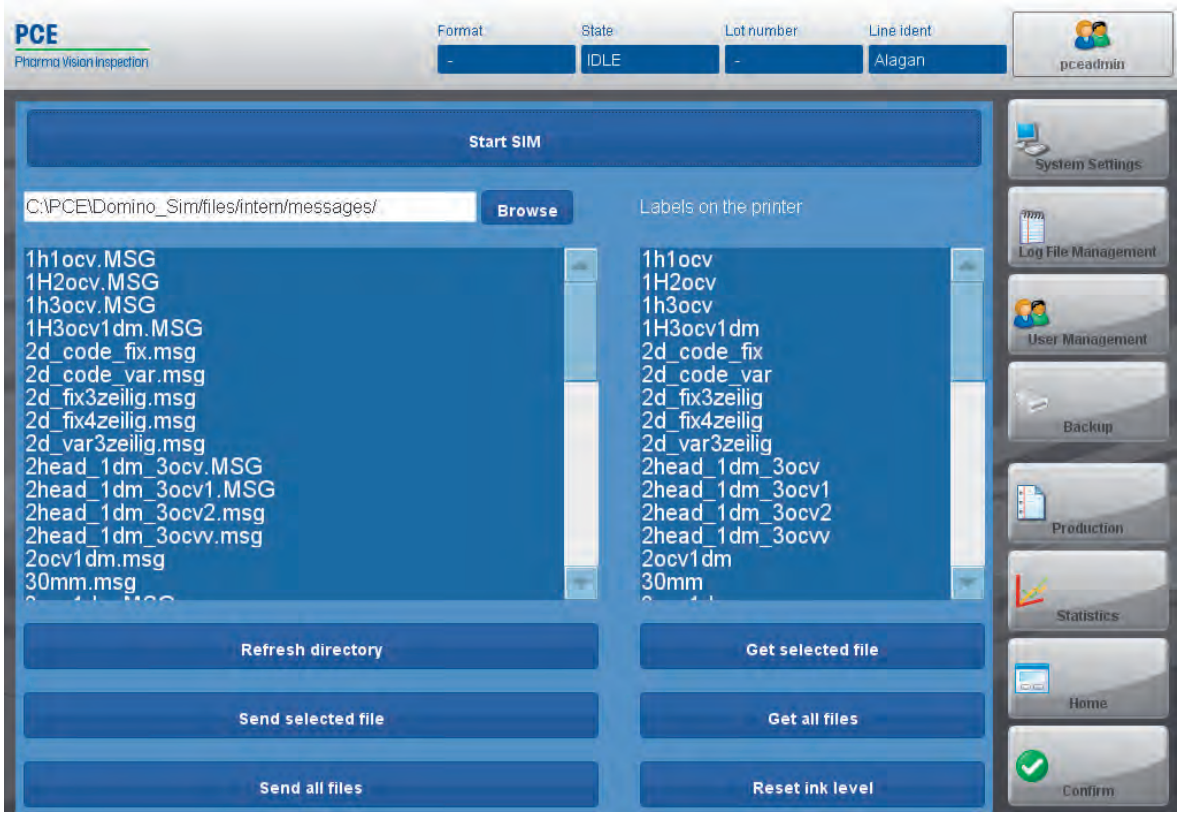


Figure: Home > Domino Printer (during production)

At this menu you have the following options:

- Start SIM: Start printer simulation software.
- Browse: Select path where the software for the APS printer simulation software can be found.
- Refresh directory: Refreshes the displayed directory.
- Send selected file: Send selected file to printer.
- Send all files: Send all files to printer.
- Get selected file: Send selected file from printer to IPC.
- Get all files: Send all files from printer to IPC.
- Reset ink level: Reset counter for the ink level after change of ink cartridge.

7.9.7 Camera Menu during Production (A-3.7.9.7)

The camera menu during production shows the reading result of the last read item. Press `Home > Camera menu > batch records > show pictures`. At this screen you can see the pictures of the Smart Camera, which have led to an error.

Camera good reading:

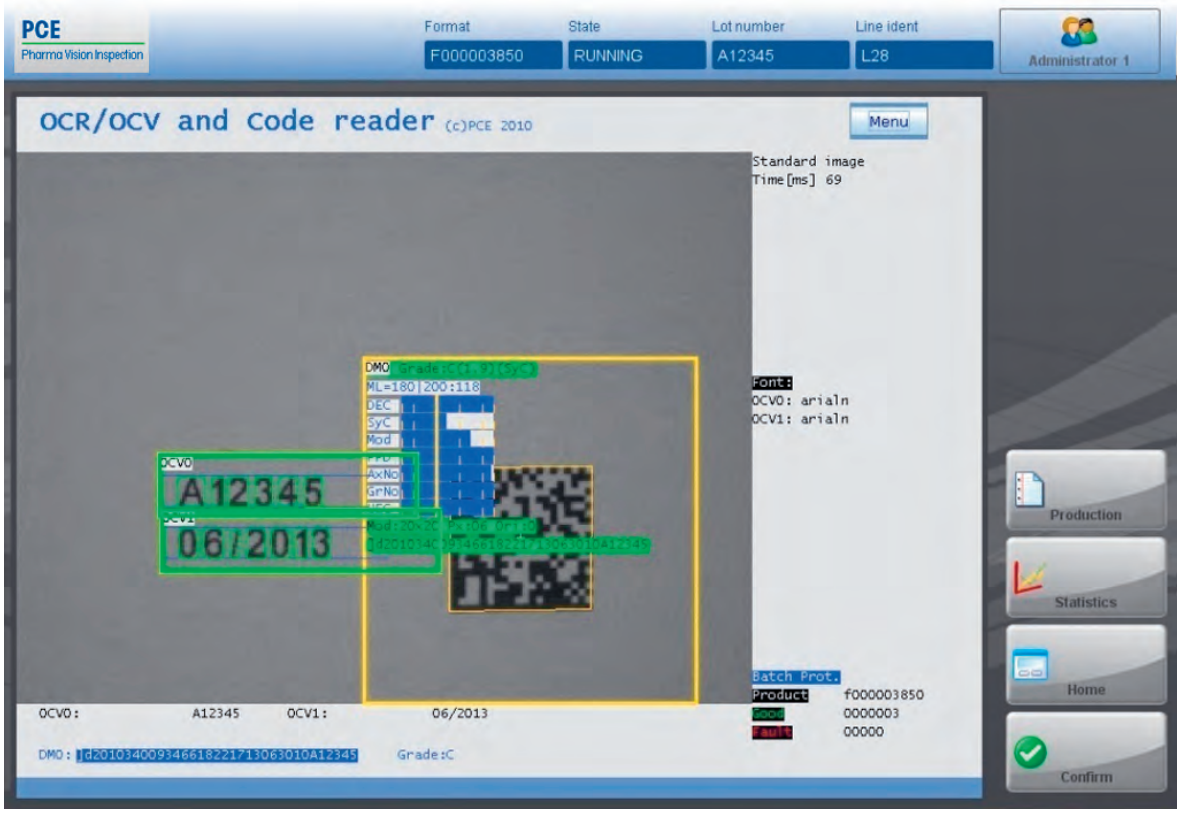


Figure: `Home > Camera menu > batch records > show pictures (during production) - good`

Camera bad reading:

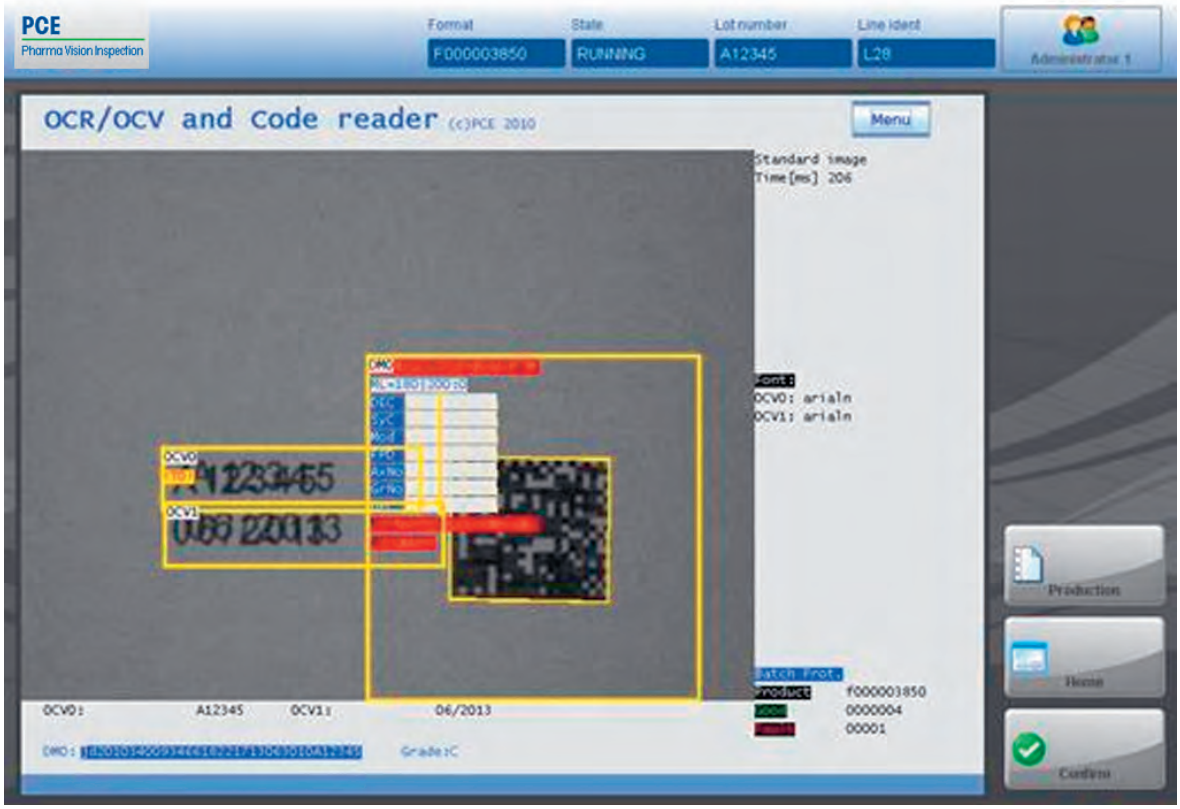


Figure: Home > Camera menu > batch records > show pictures (during production) - bad

If a reading error occurs, this is optically displayed at the `Show error images` screen by a red frame. The red frame marks the codes / numbers / characters which were detected as false. At the upper left of the red frame you see what type of error it is, e.g. OCV0, OCV1.

Note

Error Message after consecutive error

If the same error occurs consecutively (depending on system settings, consecutive error), an error message will be displayed to confirm.

7.9.8 PLC

During production PLC menu provides the information as in the following screen:

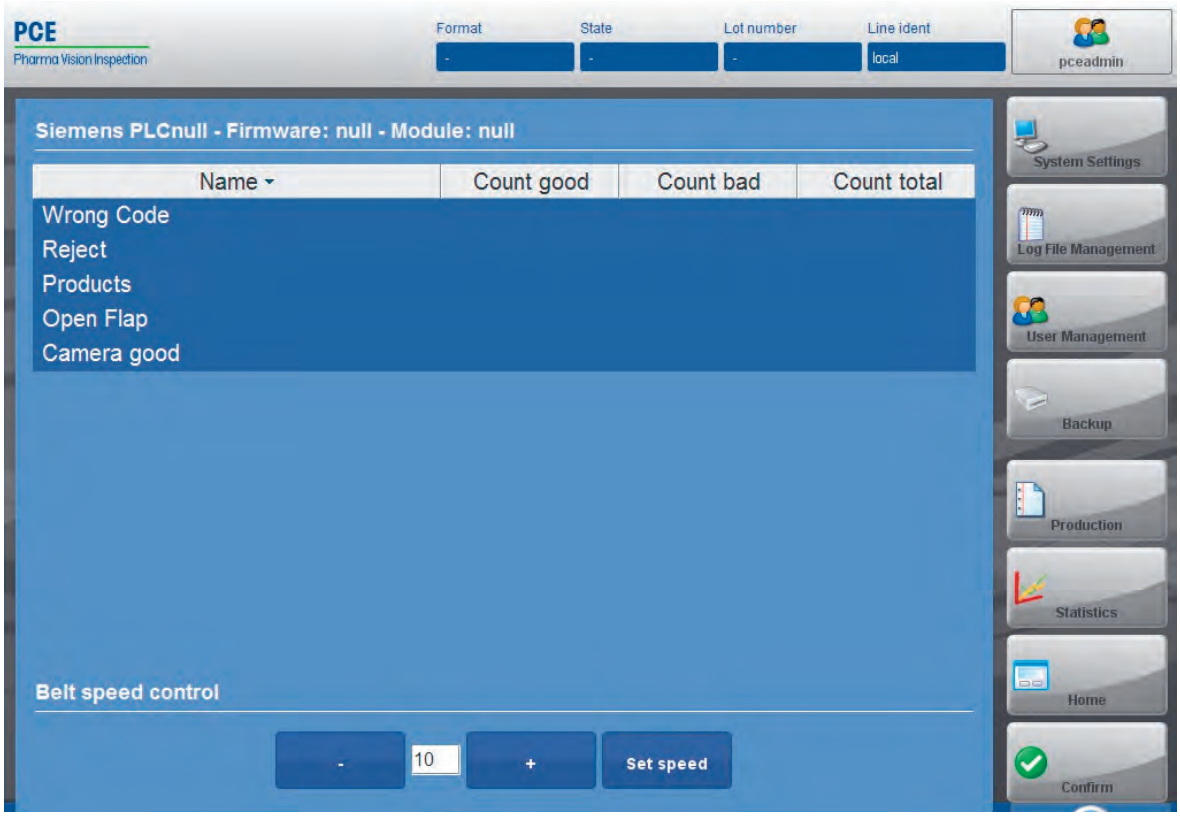


Figure: `Home > PLC (during production)`

Class name: Siemens SPS IP / SPS PPI. Only the counters are displayed.

8 How Tos

This chapter contains step-by-step instructions for serialization and aggregation with PLM on a production line.

8.1 Installation and Setup

8.1.1 Set up an Order (H-1.3)

Prerequisites: Driver software has been previously installed

Feature Background: To set up an Order on a PLM system

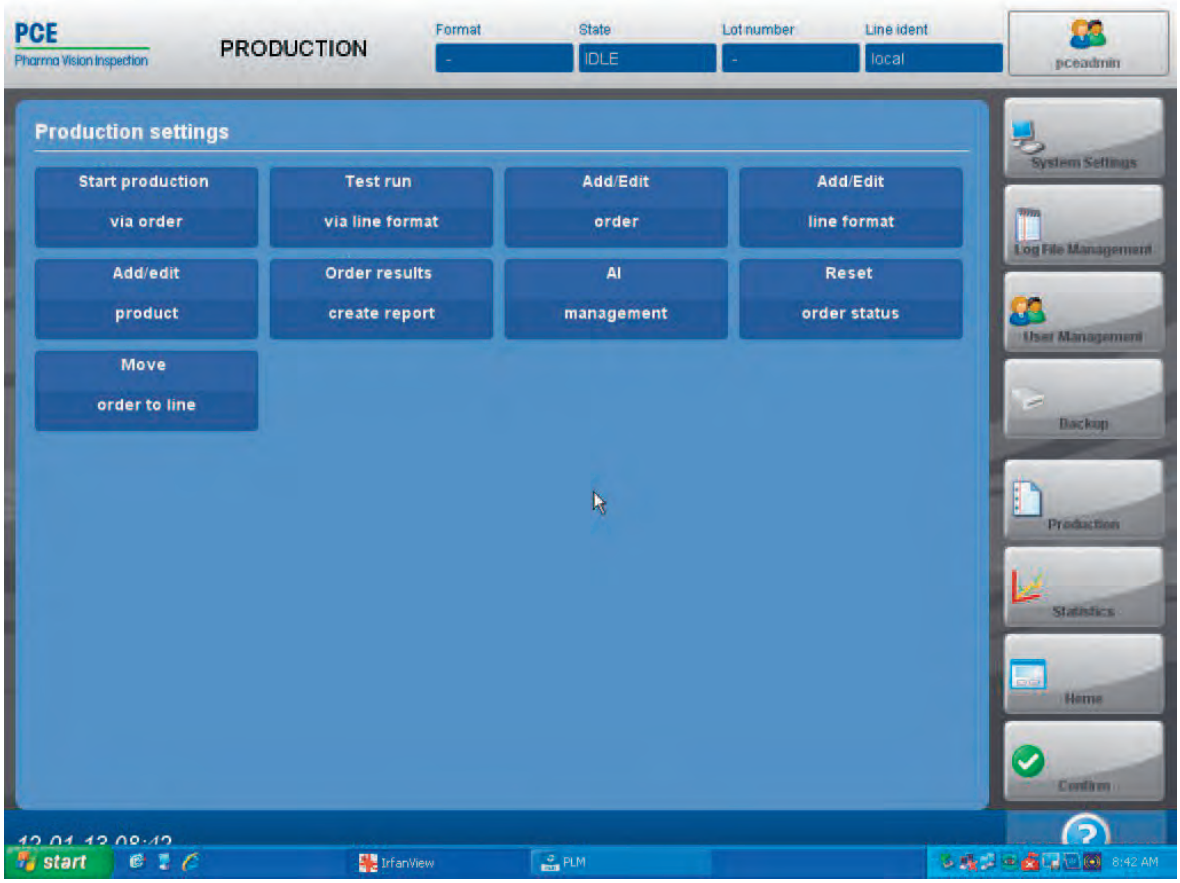
1. Login
2. Press `Production` and then `Add/Edit order`.
3. Press `Add`; Enter a name and select a line format; Press ⌥⇨◁⇨.
4. Press `Details`; Enter values for order (see chapter Order Management (A-3.7.4) (page 99)); Press `Verify Data`; If verification was completed successfully, confirm with `OK`.
5. Pres 2 x `Back`; Press `Start Production via order`.

8.1.2 Set up a Product (H-1.4)

Prerequisites: Driver software has been previously installed

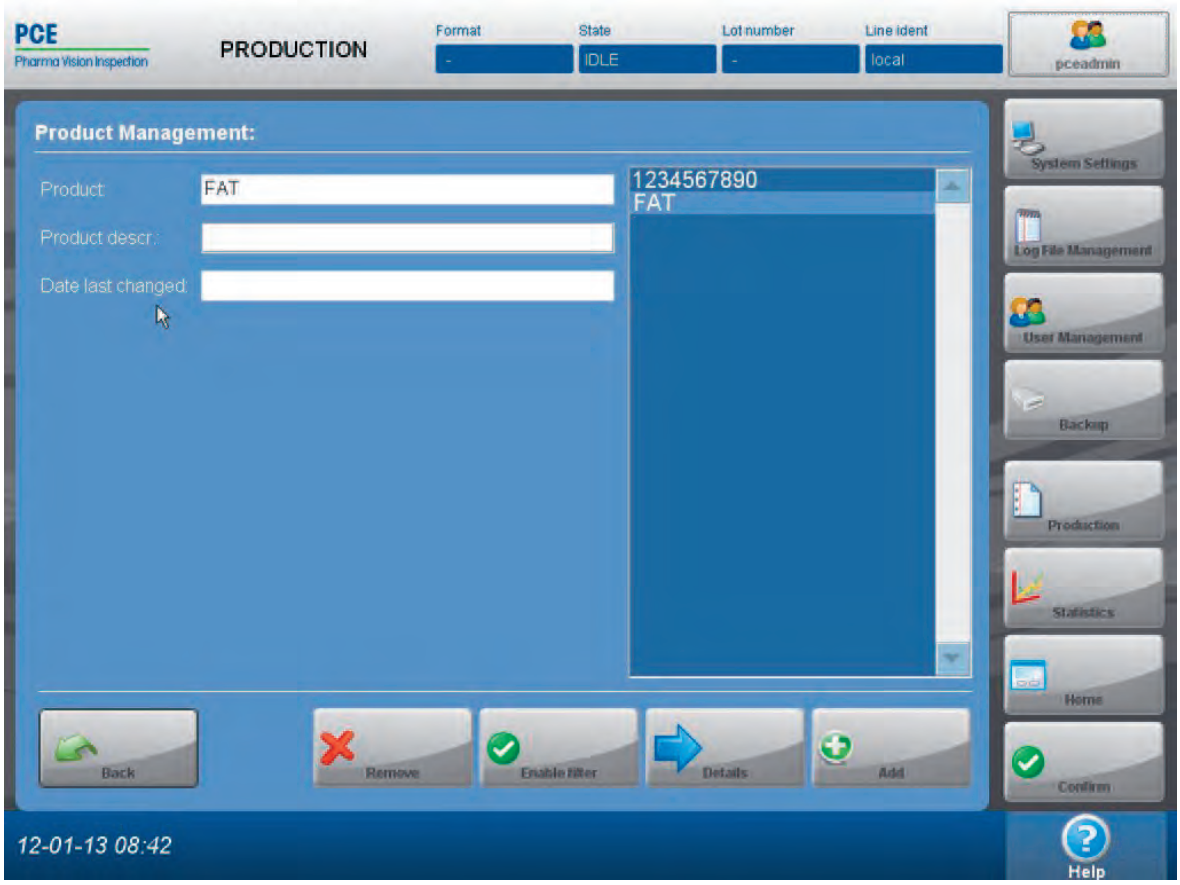
Feature Background: To set up an Order on a PLM system

1. Switch from overview to production mode

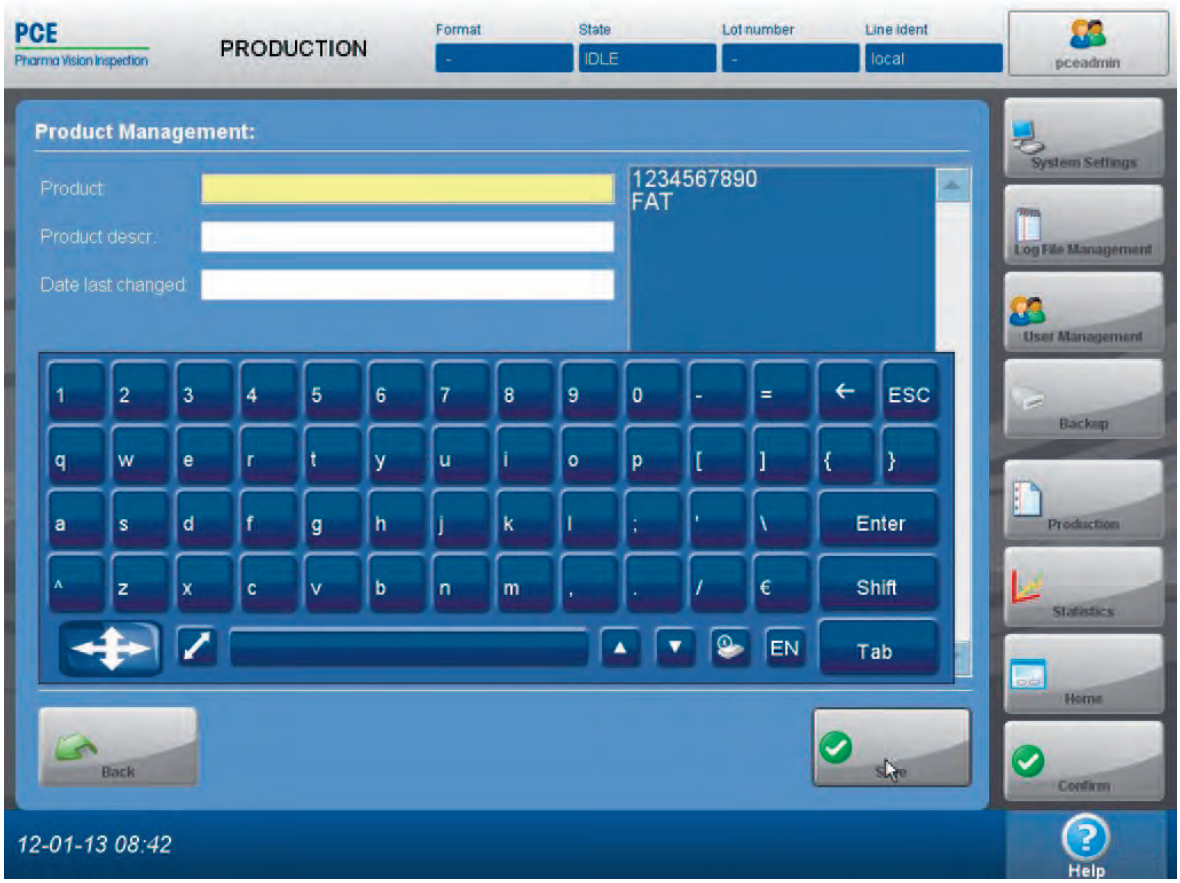


2. Switch from production mode to `Add/edit product`

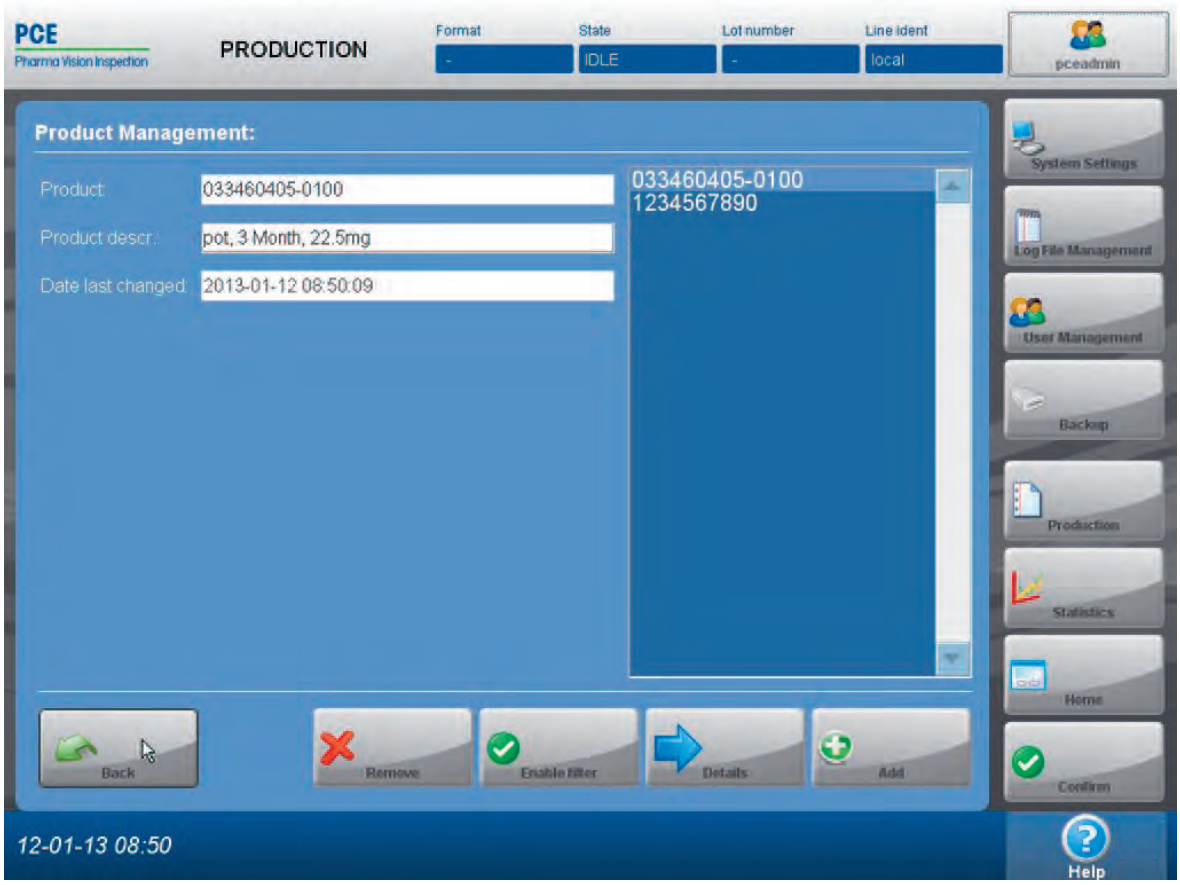
3. `Add/edit product` menu:



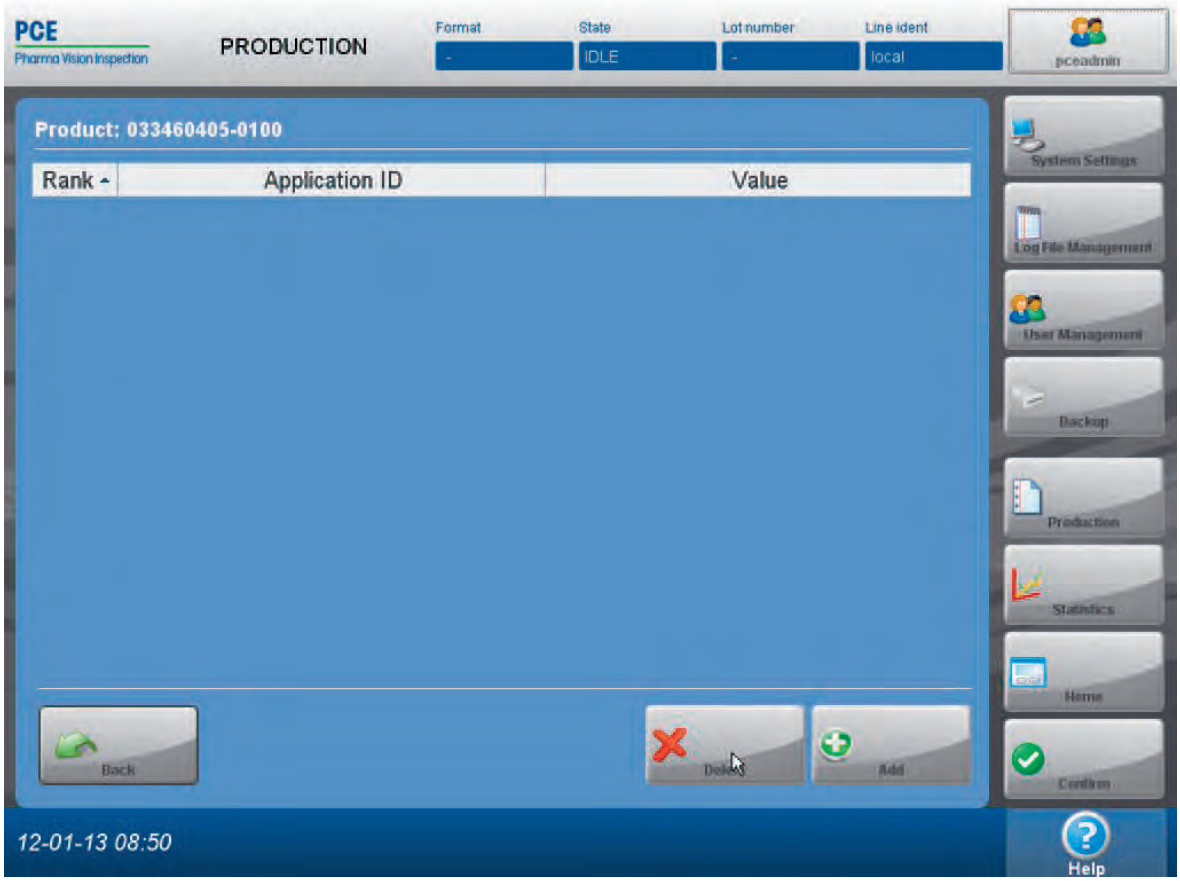
4. Place cursor in `Product` line



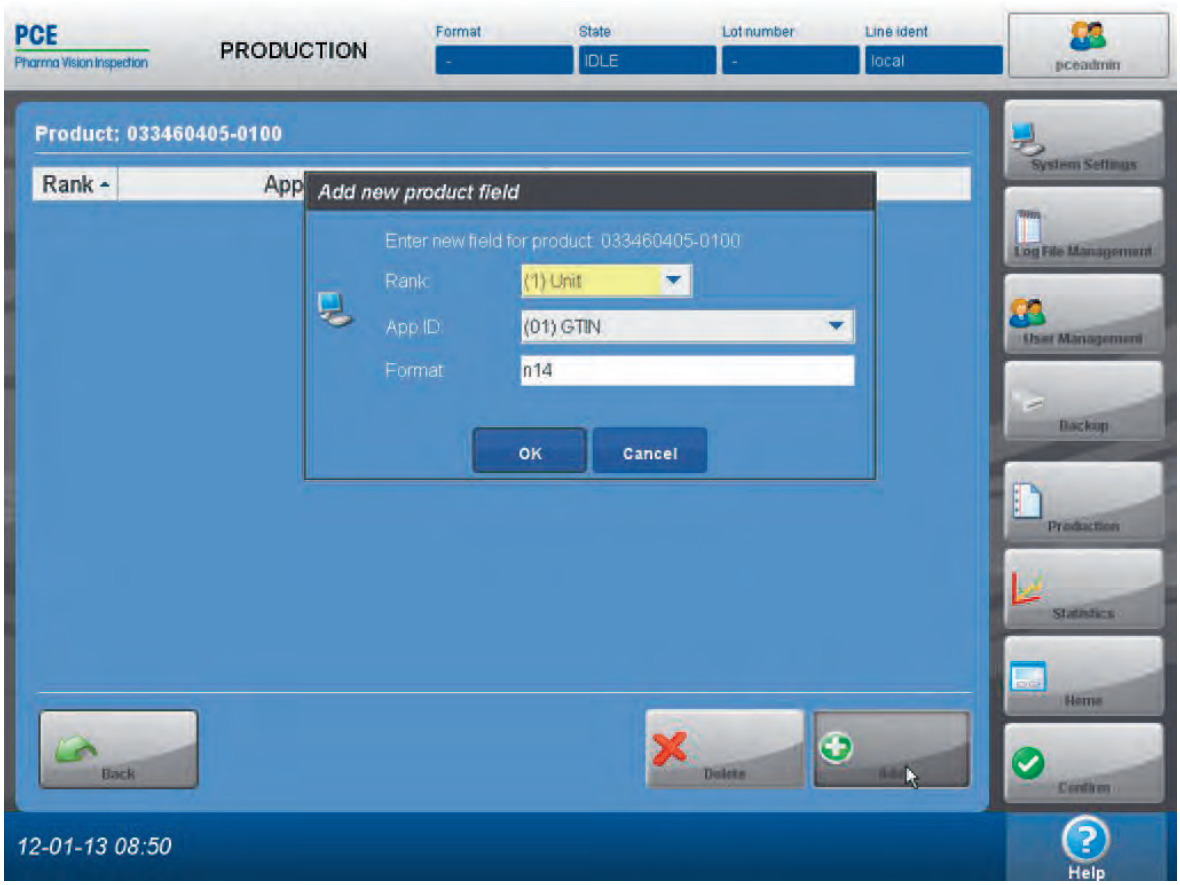
5. Enter Product name and -description



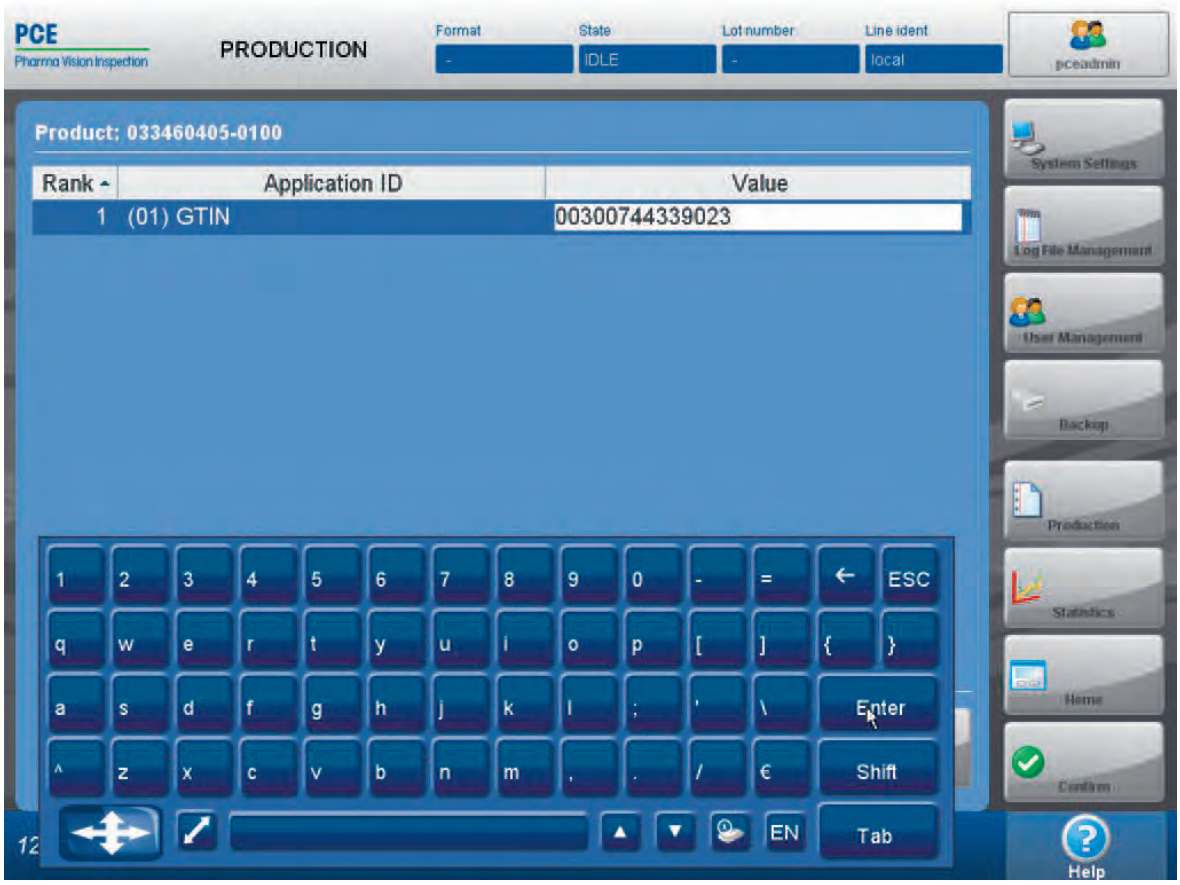
6. Menu for newly added product



7. Add new product field for new product
8. Select GTIN-product field
9. Assign Rank 1



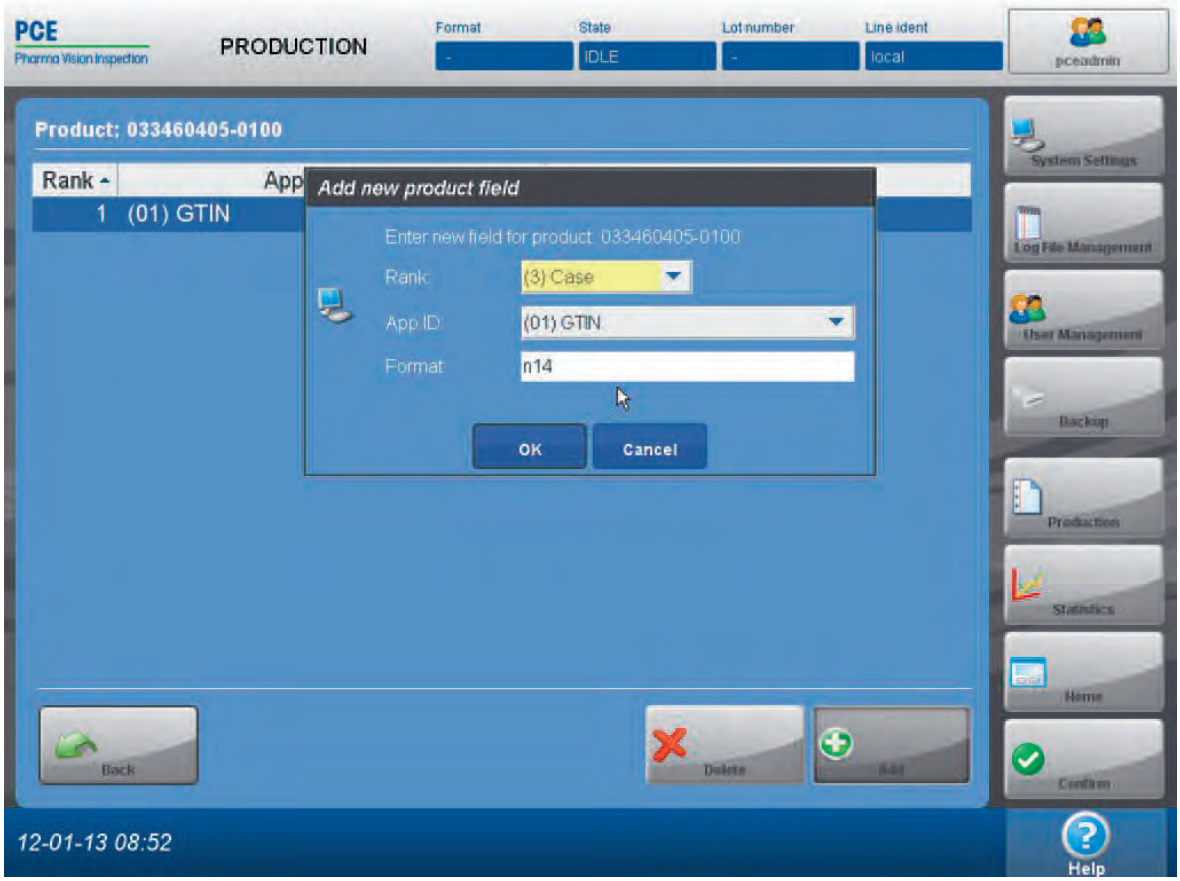
10. Define value for GTIN variable



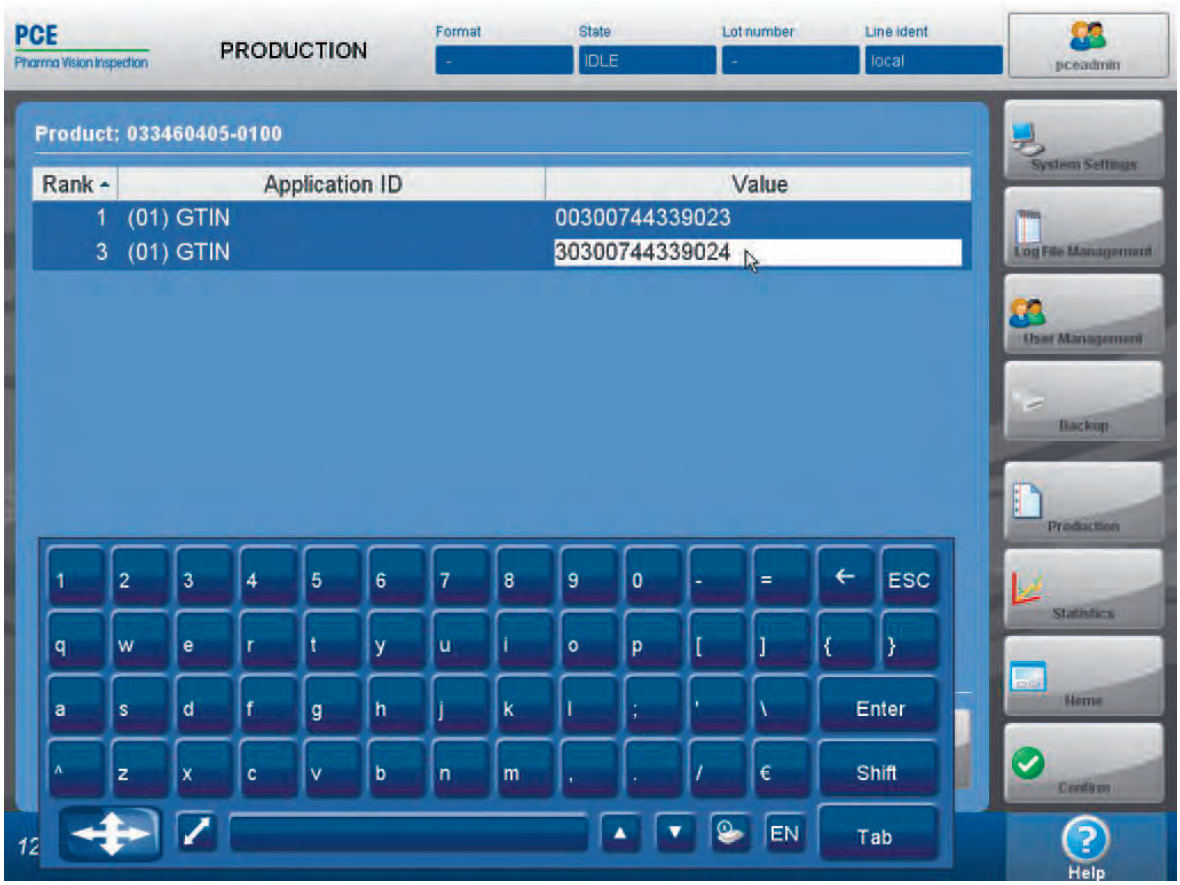
11. Add further Product filed for new product

12. Once again, select GTIN Product field

13. Assign Rank 3



14. Define value for GTIN variable



Product setup is finished.

8.1.3 Install a New PLM (H-1.2)

Prerequisites: Driver software has been previously installed

Feature Background: To set up a new PLM and keep the previous one

8.1.3.1 Installing a New PLM and Keep the Previous One

1. Login as sysadmin to the PLM
2. Use 'log off' 'exit to OS' to leave the PLM and access Windows
3. Go to the folder 'C:/PCE/Pilot/ ' rename the folder 'Pilot' to 'Pilot_old'
4. Create a new Folder named Pilot in the PCE folder

8.1.3.2 Problems that can occur

With step 4): no Windows Taskbar or Desktop as usual

Solution: plug in a keyboard and press 'ctrl' 'alt' 'delete' to start the Taskmanager

With step 3): Path not found

Solution: Right click on the PLM-icon on the Desktop to display the properties. There you can find the path.

8.2 Manual Operations

8.2.1 Handle Items at Power Failure or E-Stop (H-2.1)

Prerequisites: Driver software has been previously installed

Feature Background: To handle items after a power failure or an emergency stop

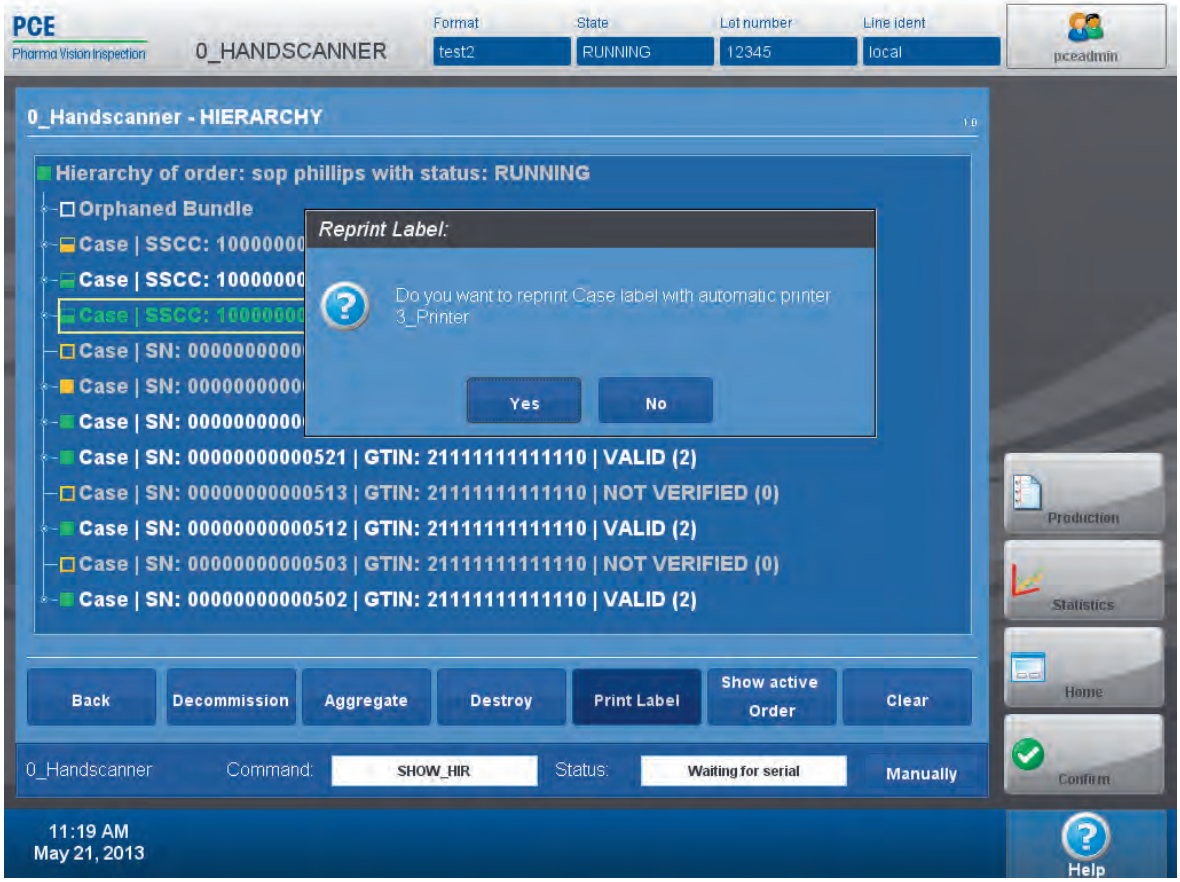
After an emergency stop or power failure, all items within the XS2MV have to be picked up and checked

1. Go to the menu `Home > Hand scanner (global) > Show information`
2. Scan the item and check the status "valid"
3. Status valid = 0: Throw away/rework the item.

Status valid = 1: Press "decommission" and check, if the status valid changes to 0. Throw away/rework the item.

8.2.2 Reprint a Case or Pallet Label (H-2.4)

1. Press `Home > Hand scanner Global > Show Hierarchy`
2. Scan case or pallet label or select label to be reprinted within the hierarchy tree.
3. Press`Print label`. Serial number can be the same or different serial number (depending on system settings).



4. Confirm with `Yes`.
5. Verify label with the (global, case or pallet respectively) hand scanner.

8.2.3 Continue Suspended Order (H-2.5)

1. Press `Production > Start Production via order`
2. Press the suspended order (order color is orange)
3. Press `Next > Start Production`

8.2.4 Suspend an Order (H-2.6)

1. Press `Production > Suspend` to suspend an order. The order data stays active, even if the system is switched off. The order color gets orange within the order list.
2. Press `Continue` to continue the order.

8.2.5 View Hierarchy (H-2.7)

1) Press `Home > Hand scanner Global.`

2) Press `Show hierarchy`

3) Scan label. Hierarchy is shown

8.2.6 Aggregate an Item to a closed Partial Case (H-3.7)

1. Press `Home > Hand scanner Global > Show Hierarchy`

2. Scan a valid and orphaned item

3. Press `Aggregate`

4. Enter SSCC of the partial case or scan case label

5. Confirm with `OK`

6. If content count is reached (case is complete), a label is printed automatically. OR If content count is not reached (case is incomplete) continue with `Partial case or pallet aggregation` to close the incomplete bundle.

8.2.7 Aggregate a case to a closed partial pallet (H-3.8)

1. Press `Home > 'Hand scanner Global' > Show Hierarchy`

2. Scan case

3. Press `Aggregate`

4. Enter SSCC of the partial pallet or scan pallet label

5. Confirm with `OK`

8.2.8 Aggregate pallet to Shipment (H-3.9)

1) A shipment is rank 5

2) Quantity of pallets for shipment has to be high enough to ensure each shipment has to be closed manually. This means the content count (AI 37) must be higher than the possible number of pallets at the shipment to ensure a SSCC label is printed.

8.2.9 Aggregate Item to Case at MAS (H-3.10)

1. Select Home > 'Hand scanner Global' > Show aggregation.

2. Select Case (Rank3) and Aggregate.

3. Scan items.

4. Select Aggregate.

5. Select Close.

6. Select Print new Label

The screen looks as follows:

7. Enter content size of new case and press Enter at the keyboard.

8. A case label will be printed.

9. Verify label with hand scanner.

10. Close the case and apply the label to the case.

9 Special Applications

9.1 Communication with Pilot Site Manager (A-3.8.1)

PLM and PSM commonly write and use the same database. These data are permanently updated by both systems.

Note

PLM and PSM use common Database

Upload of new aggregation to Pilot Site Manager (PSM) happens automatically by storing data to the database and needs no manual action.

Note

No reprocessing after upload to database

When data is already sent to the ERP System by PSM (aggregation flagged), it is not possible to reprocess.

It is possible to apply format settings to the PLM that were pre-configured in the PSM. For this refer to the PSM operating manual.

10 System Settings

10.1 Defining Database Connection

Switching between external and internal database is done by appropriate entries in the registry. To adapt the scripts to the client's requirements, the PLM registry scripts must be adapted using an editor such as Notepad.

The registry scripts save the data connection data in the Windows registry.

Example for the Microsoft SQL in Windows Registry Editor Version 5.00

[HKEY_LOCAL_MACHINE\SOFTWARE\JavaSoft\Prefs\de\pharmacontrol\tnt]

"db/Driver/Class/Name"="com.microsoft.sqlserver.jdbc./S/Q/L/Server/Driver"

"db/Connect/U/R/L"="jdbc:sqlserver:\\\\192.168.115.120:1433;/Database/Name=PCEPILOT_V1_7"

"db/Username"="sa"

"db/Password"=""

"line/Name"="local"

10.2 Switching between Lines

If you want to change production to another line you can easily do that via the switch line function. Press `Switch line` at the `systemsettings overview` (see chapter 6.2.1 (page 34)). The following screen appears:

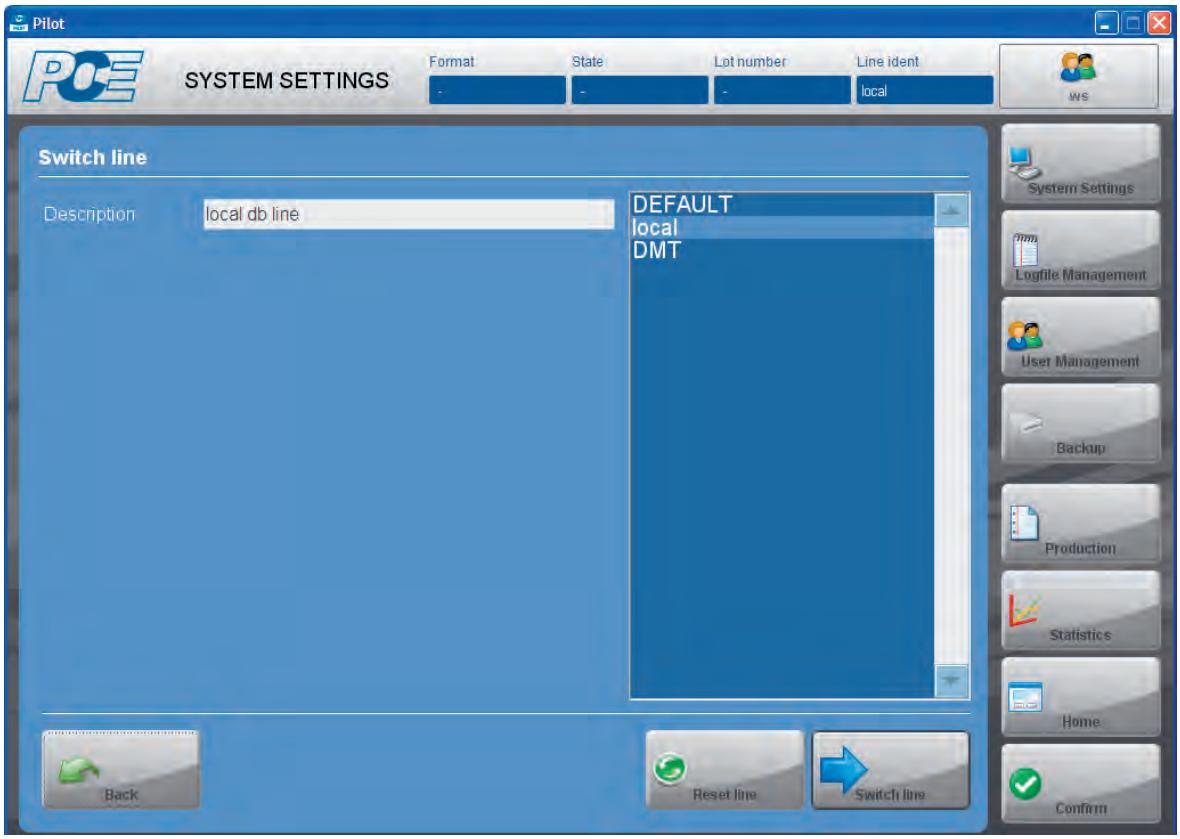


Figure: `System Settings > Switch line`

Select the desired line and press `switch line`. The line is then selected. The currently selected line is shown at the 'Line ident' field at the upper right of the screen.

10.2.1 Changing global System Settings

If you would like to change the global system settings, select 'DEFAULT' from the list, press `Switch line`. Then go to the system settings and change the values. After changing the values at the system settings go back to switch line and select the previous line.

10.3 Second Signature Configuration

Second Signature is a security feature which allows defining actions and/or messages that have to be confirmed by a second user (four-eye principle). To use this feature some configuration settings have to be set up. A list of the second signature settings can be imported and exported. To set the second signature feature you need the following user rights:

- maySeeButtonSysConfig
- mayEditSysSettings
- maySeeSecSigConfig

Preconditions

At the `user management` groups have defined levels. Only users, who are group members and who have a defined password can participate in the second signature process.

The second signature can be given only by a user which is registered at the PLM database and is not locked.

Additional rules for second signature privilege:

- The level a user belongs to is also his authorization level
- Valid group level values are 1....10. Level 10 is the highest level.
- The group level of the signing user has to be higher than the group level of the user that is to be signed.
- If a user belongs to more than one group, the authority of the higher group is valid.
- Members of the highest group level (Level10) can sign each other.
- Users not related to any group get level 0 and cannot participate in second signature.
- Users related to more than one group get the highest level among the levels of the groups

10.3.1 Activating Second Signature

In this chapter it is described how to activate and assign the 'second signature' feature.

To activate the second signature feature, perform the following steps:

Step	Description	Explanation
1	Press `System Settings > Edit System Settings`	-
2	Set a checkmark at both checkboxes of the parameter 'SI01 Second signature'.	-
3	Press `Save.`	To save the settings

To assign the second signature query for an action/message, perform the following steps:

Step	Description	Explanation
1	Press `System Settings > (Second signature action configuration or Second signature message configuration)`	According to which you want to assign (message or action)
2	Press `Import`	To load a second signature xml file (if not previously done)
3	Select the Second Signature xml file and press `open`	File will be loaded
4	Set the checks	At the checkboxes of the messages/actions which need to be confirmed with a second signature
5	Press `Save`	To save the settings
6	Restart the Pilot Line Manager	After restart changes are valid

10.3.2 Second Signature Group

This parameter is used to facilitate the second signature function. If this parameter is activated all other group hierarchies in terms of second signature are unregarded and only users who join the "SI02 Second Signature" group are allowed to confirm. All other users do not have confirmation rights.

To activate the 'SI02 second signature group' feature, perform the following steps:

Step	Description	Explanation
1	Press `System Settings > Edit System Settings`	-
2	Enter the parameters for: 'AD01 Active Directory server name'; AD02 Active Directory domain name'; AD03 Active Directory search path'; AD02 Active Directory search filter'.	This is a precondition to use the function. The parameters are grayed out because these are global system settings. How to change the settings see chapter 9.2.1 (page 163).
3	Set a checkmark at both checkboxes of the parameter 'SI02 Second signature group'.	-
4	Press `Save.`	To save the settings

After activating the 'second signature group' function you can add users to the group to allocate second signature rights to them.

10.3.3 Message Configuration Screen

Within this menu you can define the messages which need to be confirmed with a second signature. A list of the available alarm and warning numbers can be imported. The data can be imported and exported as an XML file.

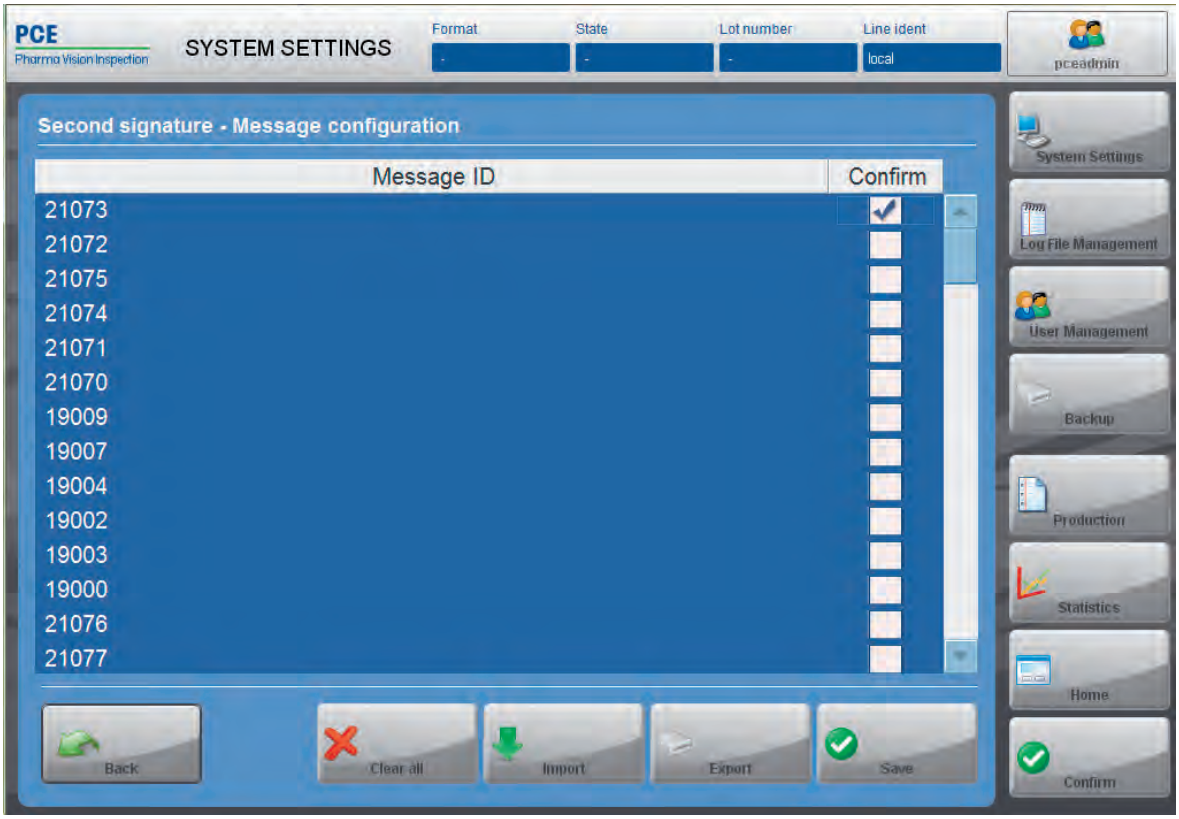


Figure: System Settings > Second signature message configuration

10.3.4 Action Configuration Screen

Within this menu you can define the actions which need to be confirmed with a second signature by setting a checkmark at its checkbox. A list of the available actions can be imported. The data can be imported and exported as an XML file.

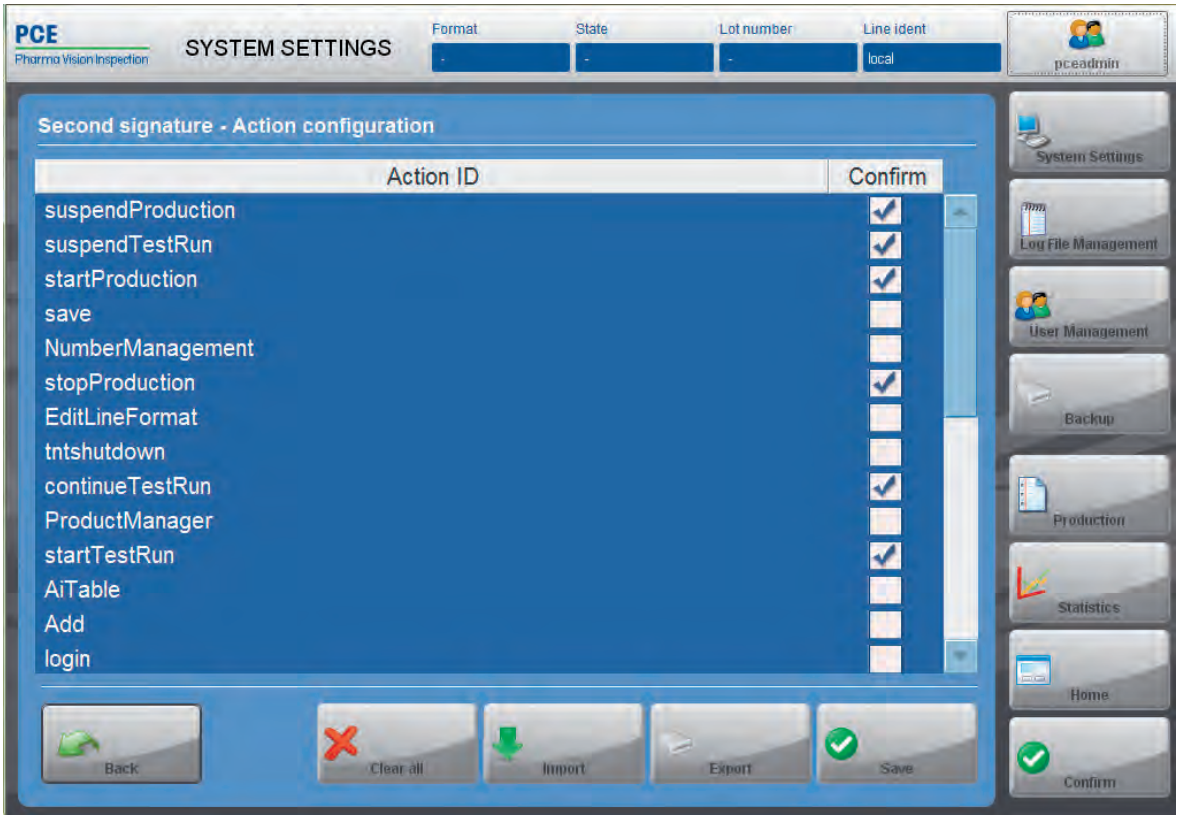


Figure: `System Settings > Second signature action configuration`

10.3.5 Importing / Exporting the Second Signature XML File

The second signature xml file contains all actions / messages for which the feature is available.

Import

To import the second signature xml file press `System Settings > (Second signature action configuration` or `Second signature message configuration) > import > (Select the Second Signature xml file) > open.`

Export

To export the second signature xml file press `System Settings > (Second signature action configuration or Second signature message configuration) > export.`

10.4 Importing ERP Data over XML Configuration

Within this menu you can define the paths, where the Pilot Line Manager gets order and product data of an XML document.

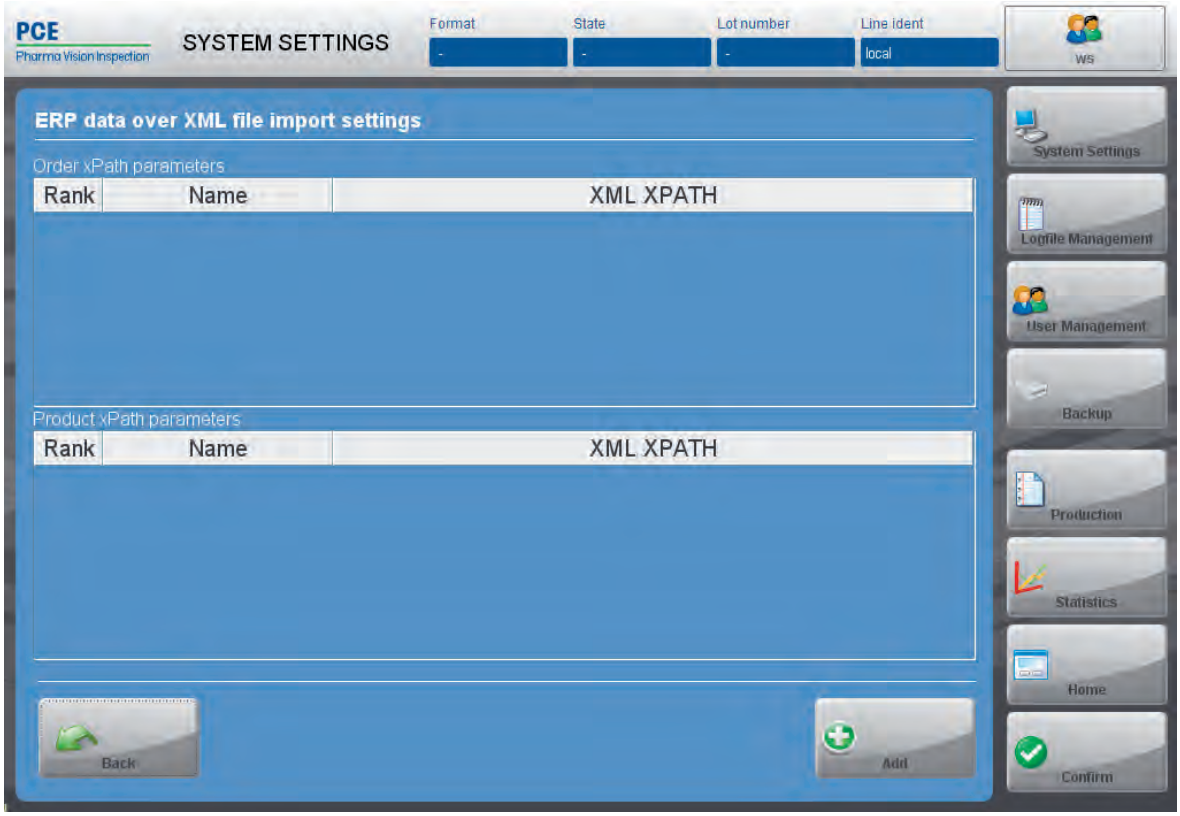


Figure: `System Settings > Importing ERP Data over XML Configuration`

Press `Add` and select a new path for the XML configuration and confirm.

10.5 Email Notification

The email notification allows informing users about internal error messages via email.

The email notification is implemented as a device class. Thus a device has to be created in order to use it. Create a device. Name the device "Email_Notification". How to create a device see chapter 6.2.4 (page 39) Creating a Device (page 39). Select `PCE_EMAIL_NOTIFICATION` as Class name. Press `OK`.

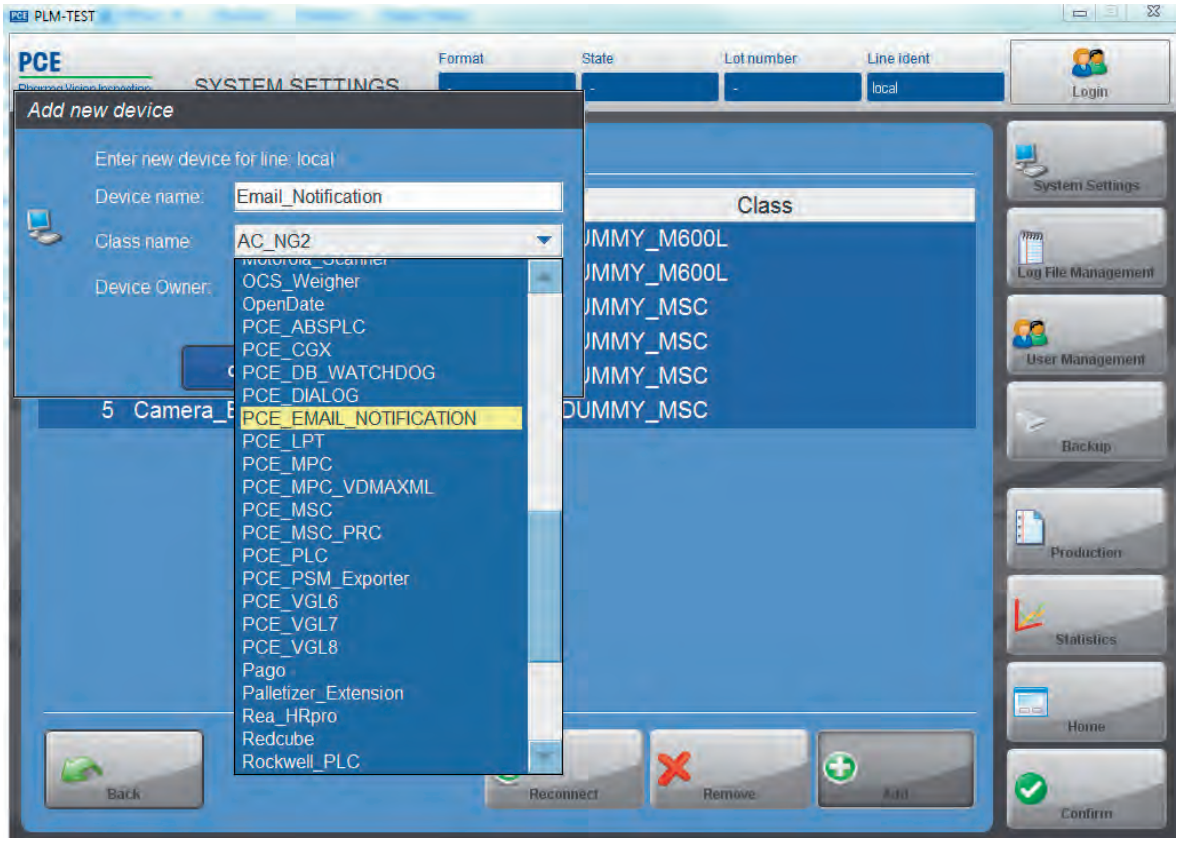


Figure: System Settings > Create edit device/add device

Open The Email notification by clicking the following path:

System Setting > Edit Device Settings > Email_Notification

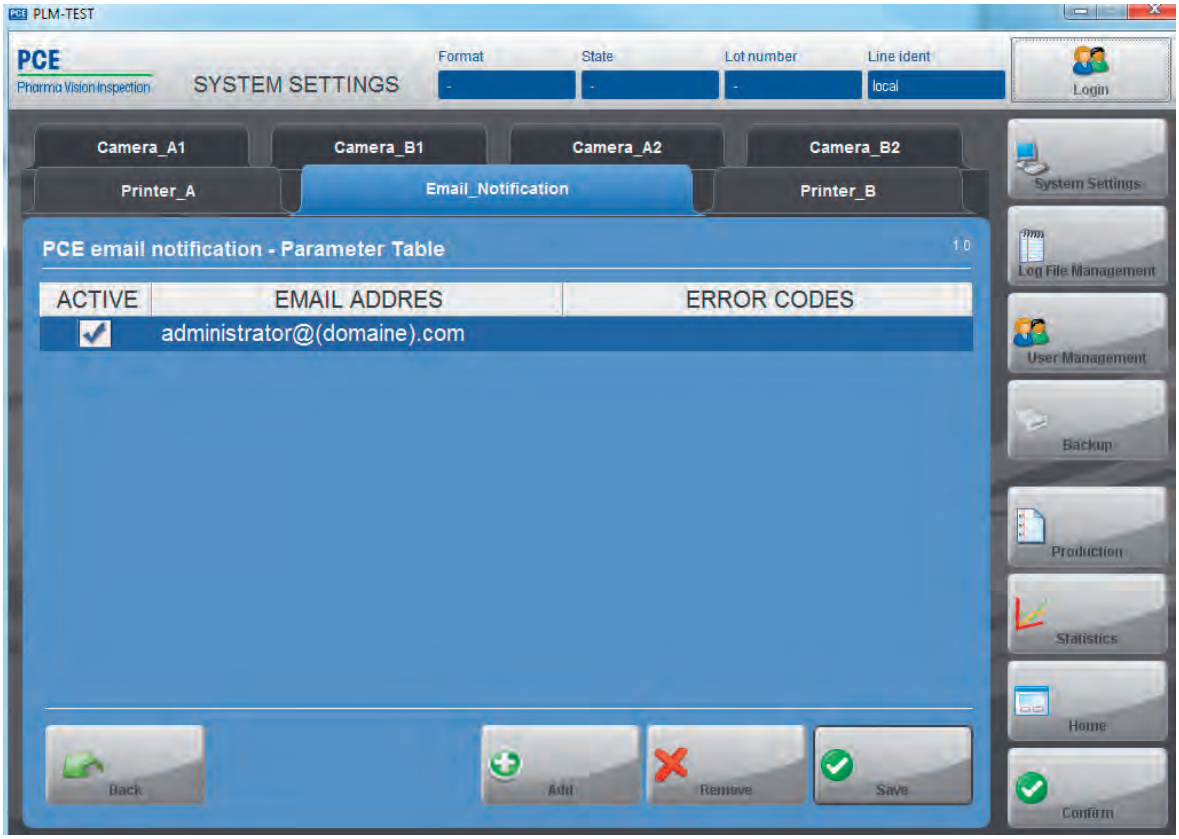


Figure: System Settings > Add Edit Device Settings > Email_Notification

At the tab enter the following Data:

Field Name	Example	Description
Name:	Email_Notification	The device name is entered
Description:	PCE Email Notification	The name of the email subject line
DafaultSenderAd-dress:	EmailnotIfication@(domain).com	Sender Address
DafaultUser:	Anonymous@(domain).com	Email server address
MailHost:	info.(domain).com	Host Address
Password:	*******	Password
BoxingRank:	(0) Global	Predefined

Press `Parameters`. Enter a destination email address where the email has to be sent to and enter the desired error code which has to be sent to this address. Repeat this step for several email addresses. Press `save` to save the email notification settings.

10.6 Edit Month Name List

Within this menu you can define the input and output format of the name of the month. To get to the dialog press `System Settings > Edit month name list`. Numeric values will be converted into names, e.g. „04" into „APR"/"Apr"/"Apr." (depending on the format „MNL01"/"MNL02"/"MNL03"). The conversion of the read-in data is realized provided that they correspond to the respective format.

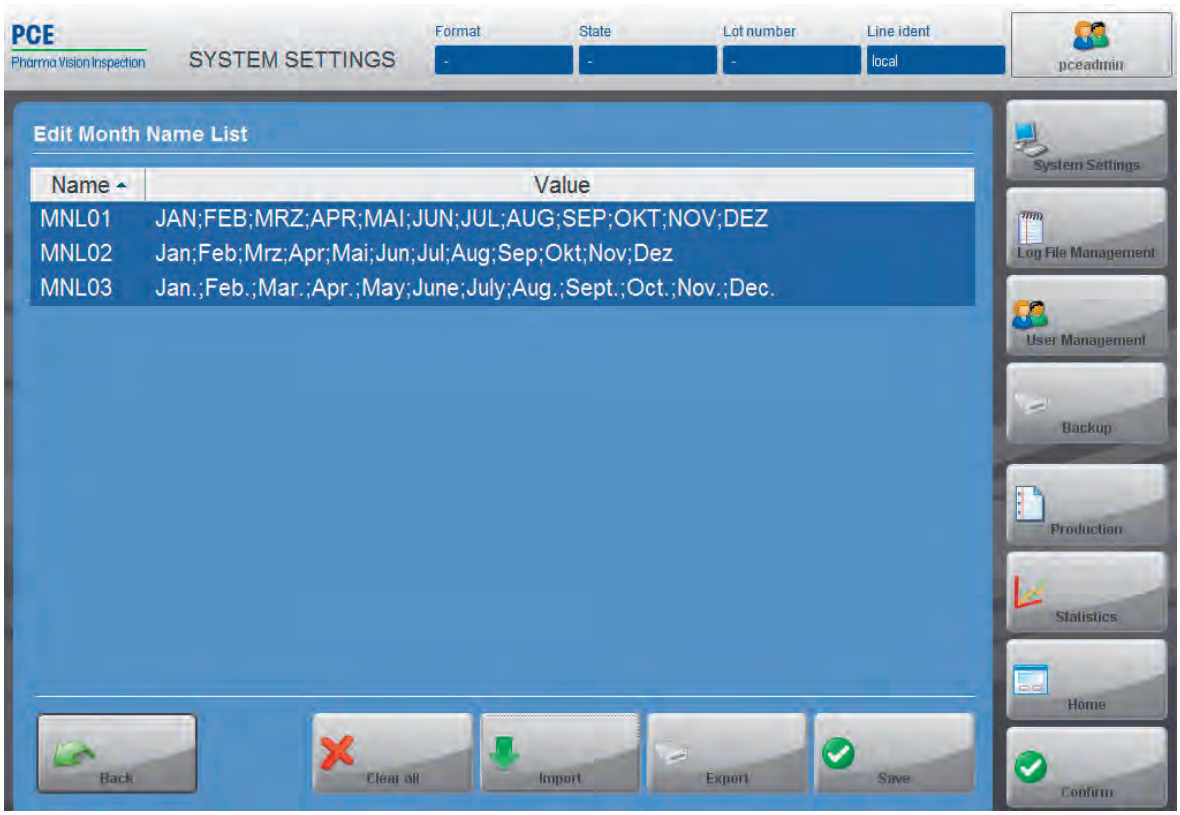


Figure: `System Settings > Edit month name list`

The following figure shows that OCV0 expects the format JAN/FEB/MRZ/… (="MNL01").

- MNL01: JAN;FEB;MRZ;APR;MAI;JUN;JUL;AUG;SEP;OKT;NOV;DEZ
- MNL02: Jan;Feb;Mrz;Apr;Mai;Jun;Jul;Aug;Sep;Okt;Nov;Dez
- MNL03: Jan.;Feb.;Mar.;Apr.;May;June;July;Aug.;Sept.;Oct.;Nov.;Dec.
- MNL04: Q1;Q1;Q1;Q2;Q2;Q2;Q3;Q3;Q3;Q4;Q4;Q4

To save the Month Name list press Save.

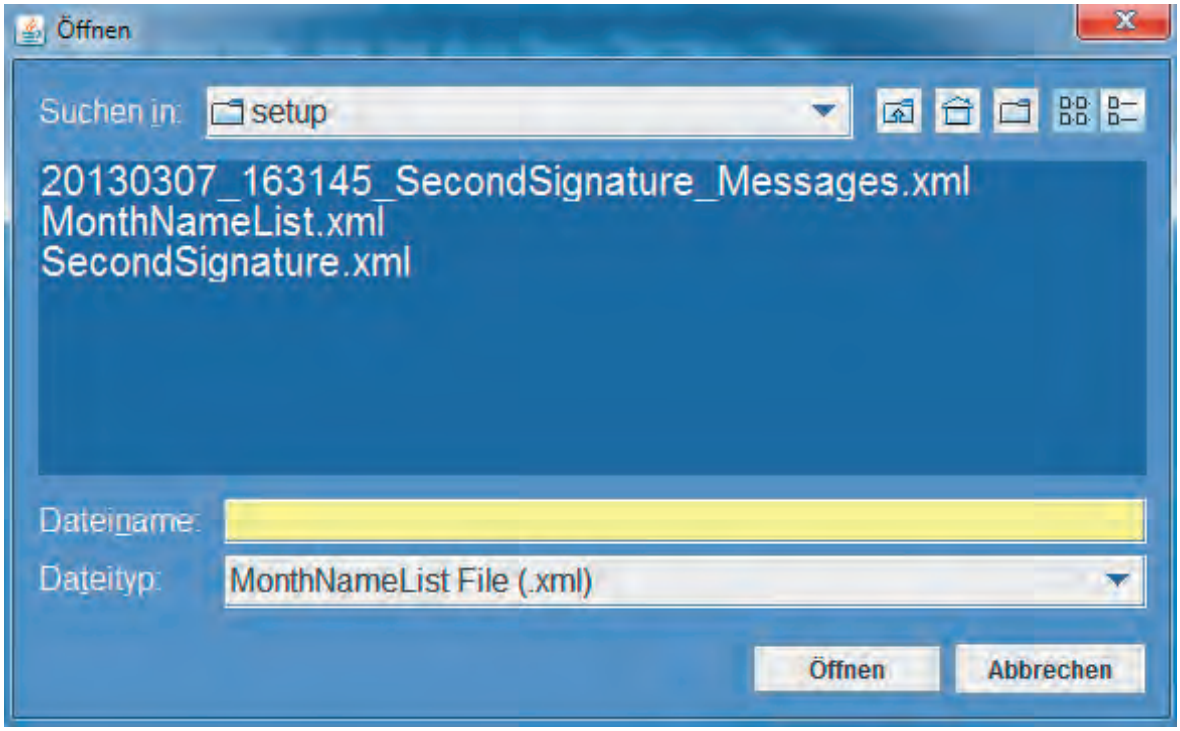


Figure: `System Settings > Edit month name list > Import`

10.7 System Information

The `System information` screen on the tab system information you find the following system information:

- Operating System
- Network
- Database
- Devices
- Line Settings
- Second Signature

10.7.1 Extracting System Information

To get an overview of every installed software and device open the `System Settings` screen (see: Chapter 6.2.1 (page 34)) and press `System Information`. The following screen appears:

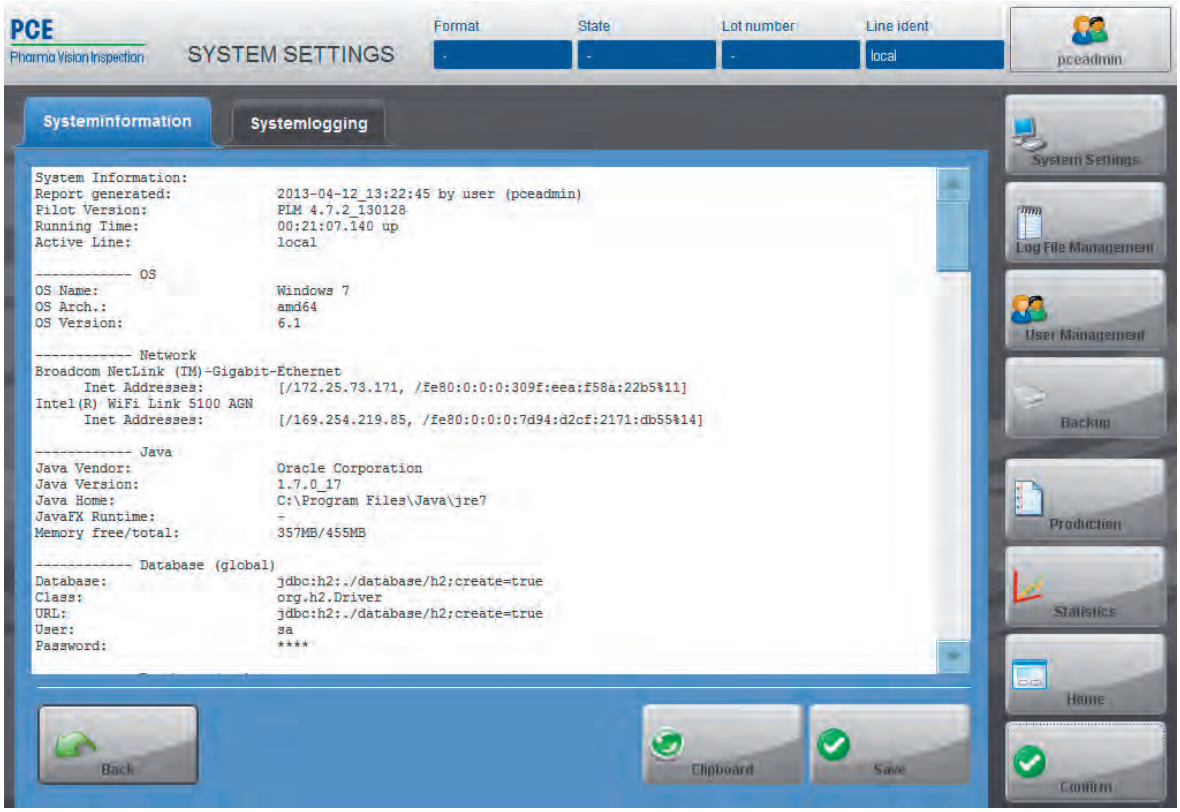


Figure: `System Settings > System information`

Press `Clipboard` to copy the information into the clipboard in order to insert it into an editor (e.g. notepad). Press `Save` to save the system information into the 'system_info.log' file in the "C:/PCE/Pilot/log" path (or in the "PDF Templates" path defined in the system settings, if applicable).

10.7.2 System Logging

Program reports-log files are displayed in this menu for informational purposes and for error searches. The content is saved in the "plm.log" file in the "C:/PCE/Pilot/log" path (or in the "PDF Templates" path defined in the system settings, if applicable).

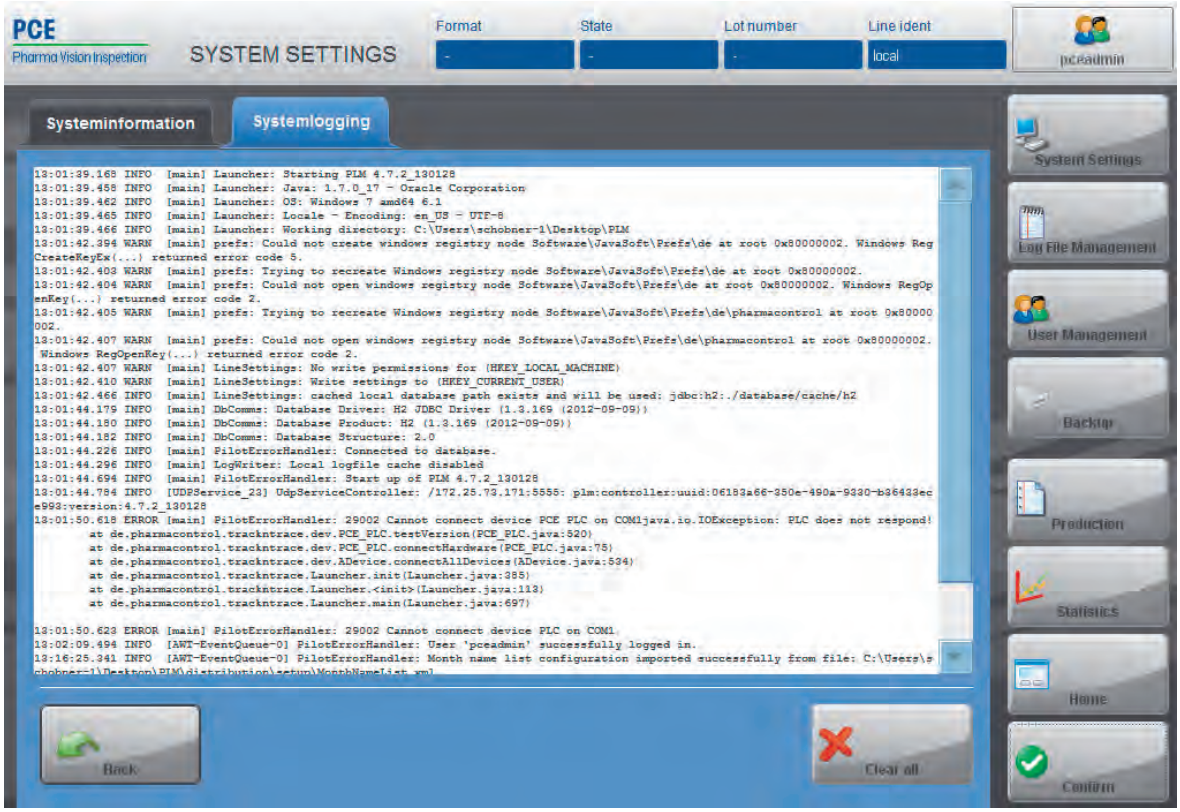


Figure: System settings > System information > System logging tab

10.8 Remove / Save Error Images

At this screen you save error images or remove error images that are no longer needed. Press System Settings - Remove save error images to get to this dialog. Select an image and save it with the Saveor remove it with Delete.

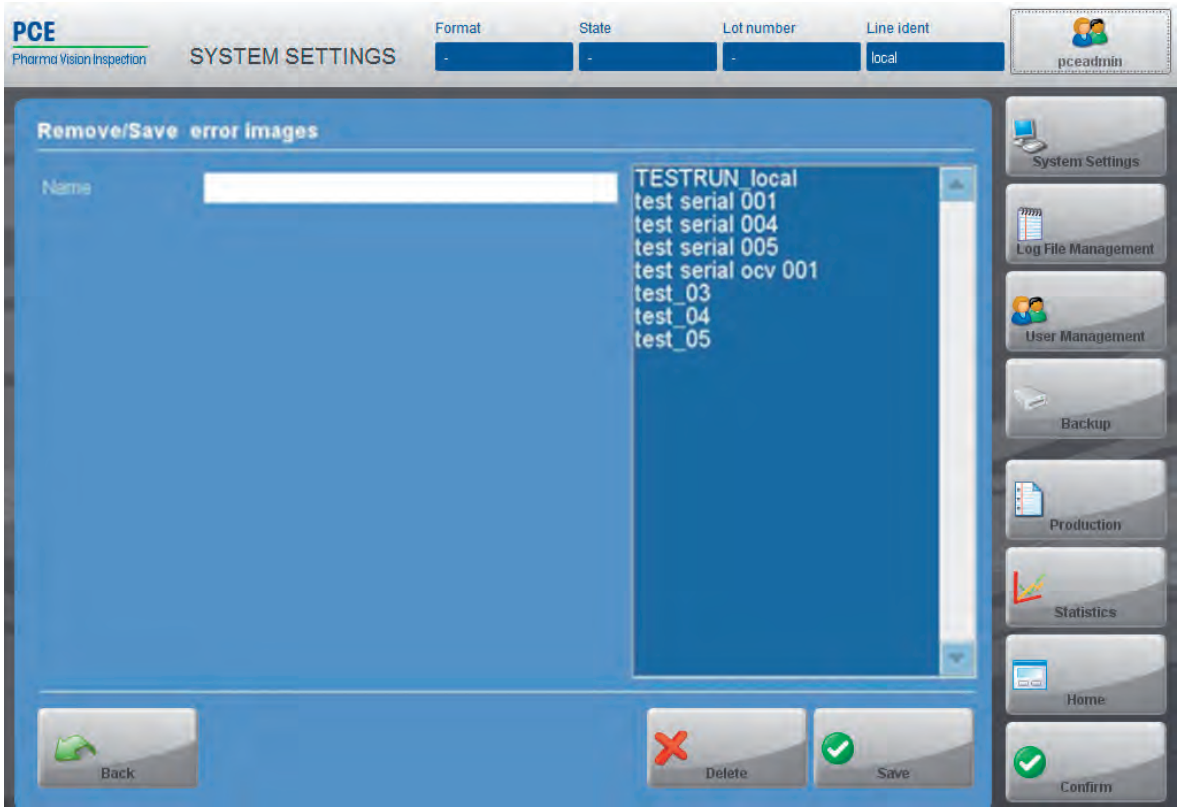


Figure: System Settings > Remove save error images

11 Statistics

11.1 Log File Management (A-3.10.1)

A log file mechanism is closely linked to the user rights system. The PLM provides a fully integrated system wide log file function, which itself can be accessed via a login mechanism.

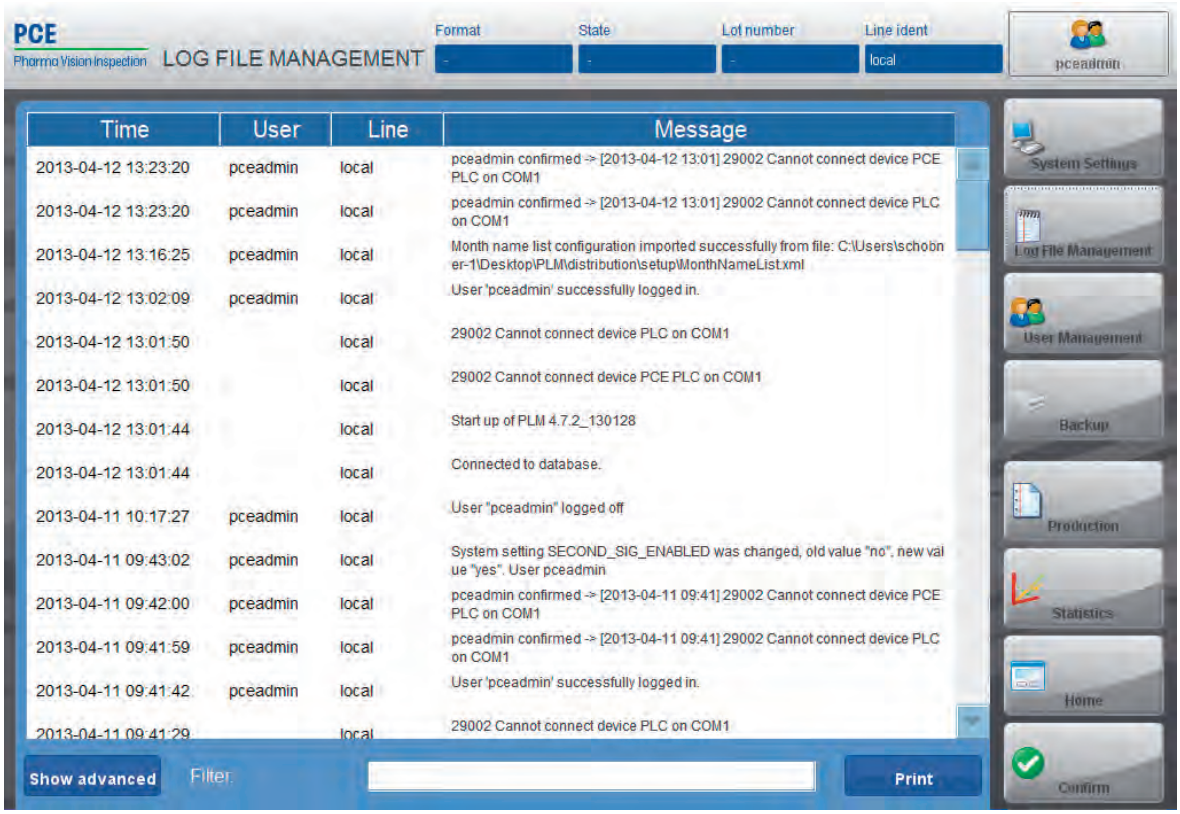

PCE
Pharma Vision Inspection
LOG FILE MANAGEMENT
Format
State
Lot number
Line ident
local
pceadmin
Time
User
Line
Message
2013-04-12 13:23:20 pceadmin local pceadmin confirmed -> [2013-04-12 13:01] 29002 Cannot connect device PCE PLC on COM1
2013-04-12 13:23:20 pceadmin local pceadmin confirmed -> [2013-04-12 13:01] 29002 Cannot connect device PLC on COM1
2013-04-12 13:16:25 pceadmin local Month name list configuration imported successfully from file: C:\Users\schobner-1\Desktop\PLM\distribution\setup\MonthNameList.xml
2013-04-12 13:02:09 pceadmin local User 'pceadmin' successfully logged in.
2013-04-12 13:01:50 local 29002 Cannot connect device PLC on COM1
2013-04-12 13:01:50 local 29002 Cannot connect device PCE PLC on COM1
2013-04-12 13:01:44 local Start up of PLM 4.7.2_130128
2013-04-12 13:01:44 local Connected to database.
2013-04-11 10:17:27 pceadmin local User "pceadmin" logged off
2013-04-11 09:43:02 pceadmin local System setting SECOND_SIG_ENABLED was changed, old value "no", new value "yes". User pceadmin
2013-04-11 09:42:00 pceadmin local pceadmin confirmed -> [2013-04-11 09:41] 29002 Cannot connect device PCE PLC on COM1
2013-04-11 09:41:59 pceadmin local pceadmin confirmed -> [2013-04-11 09:41] 29002 Cannot connect device PLC on COM1
2013-04-11 09:41:42 pceadmin local User 'pceadmin' successfully logged in.
2013-04-11 09:41:29 local 29002 Cannot connect device PLC on COM1
System Settings
Log File Management
User Management
Backup
Production
Statistics
Home
Confirm
Show advanced
Filter:
Print

Figure: `Log File Management`

The PLM log file mechanism executes an automatic login/logout protocol.

- All actions are registered and recorded automatically
- All actions are marked with a time stamp
- Also changes in the allocation of user rights are registered in the log file and are therefore traceable

All information to be recorded in the present log file is sorted according to date in the main window. The log file data is archived on a database. Data backup and time span of the storage is determined customized.

`Print` creates a PDF-report of all logged data in the database. This report is digitally signed and can be archived (customized) or printed directly.

Note

All actions are marked with a time stamp

You can view the time stamps at the log file.

Show advanced

To show the Filter screen press Show advanced. The following screen appears:

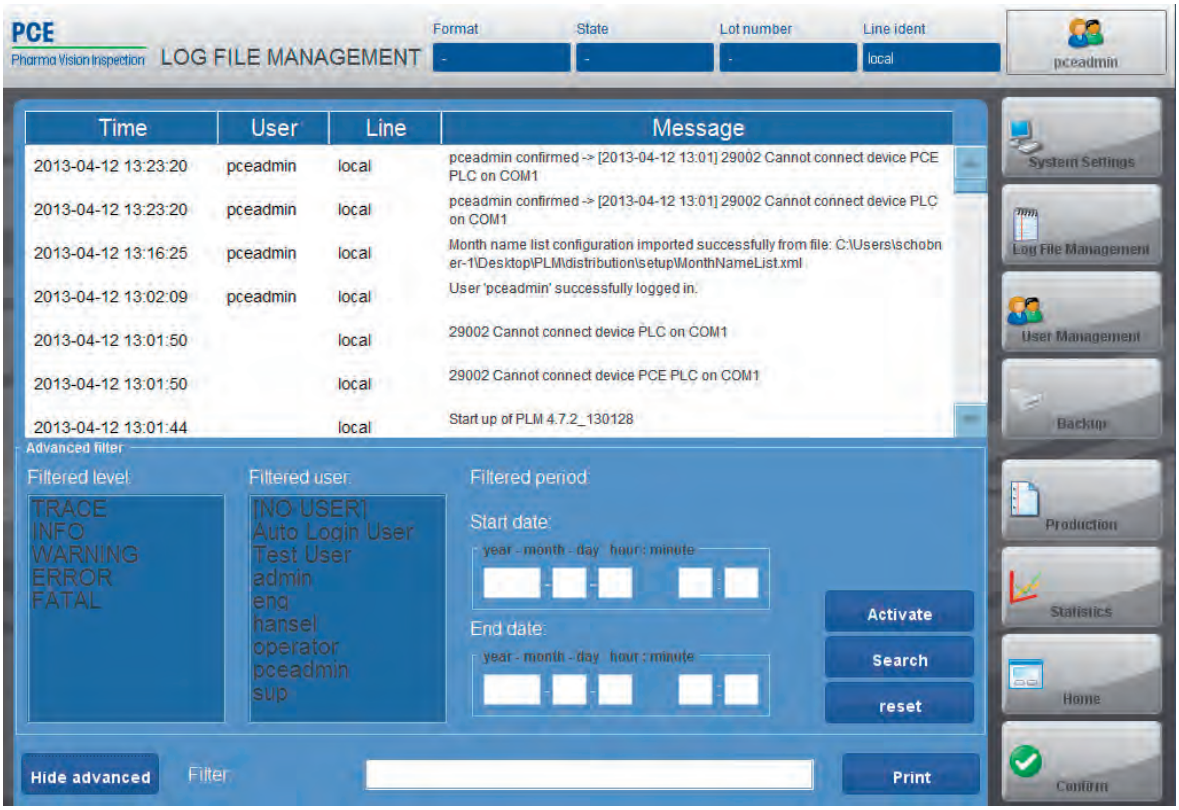


Figure: `Log File Management > show advanced`

`Hide advanced` leads back to the log file screen without view of the filter screen.

To look for special messages, you can filter the list:

Press `Activate`.

Choose 'Filtered level' and 'Filtered User'. Multiple choices are possible.

Insert filtered period, if wished.

Press `Search`.

If you want to look for a special word, you can enter it into the field 'Filter:' and the search starts immediately. With the `Print` key, a file is generated in the selected format. The latter is saved in the "C:/PCE/Pilot/pdf" path (or in the "PDF Templates" path defined in the system settings, if applicable).

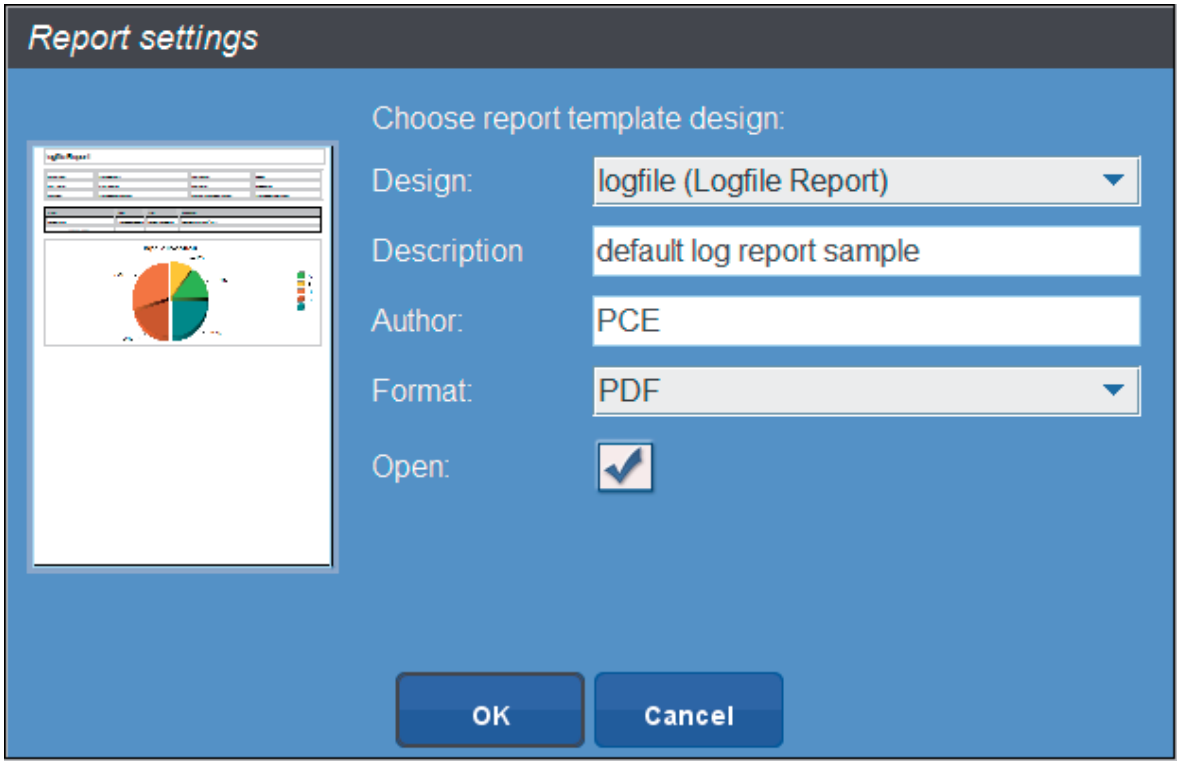


Figure: `Log File Management > show advanced > Print`

11.2 View statistics (A-3.10.2)

The PLM is provided with some statistic functions. Press statistics to get the statistics menu, see below:

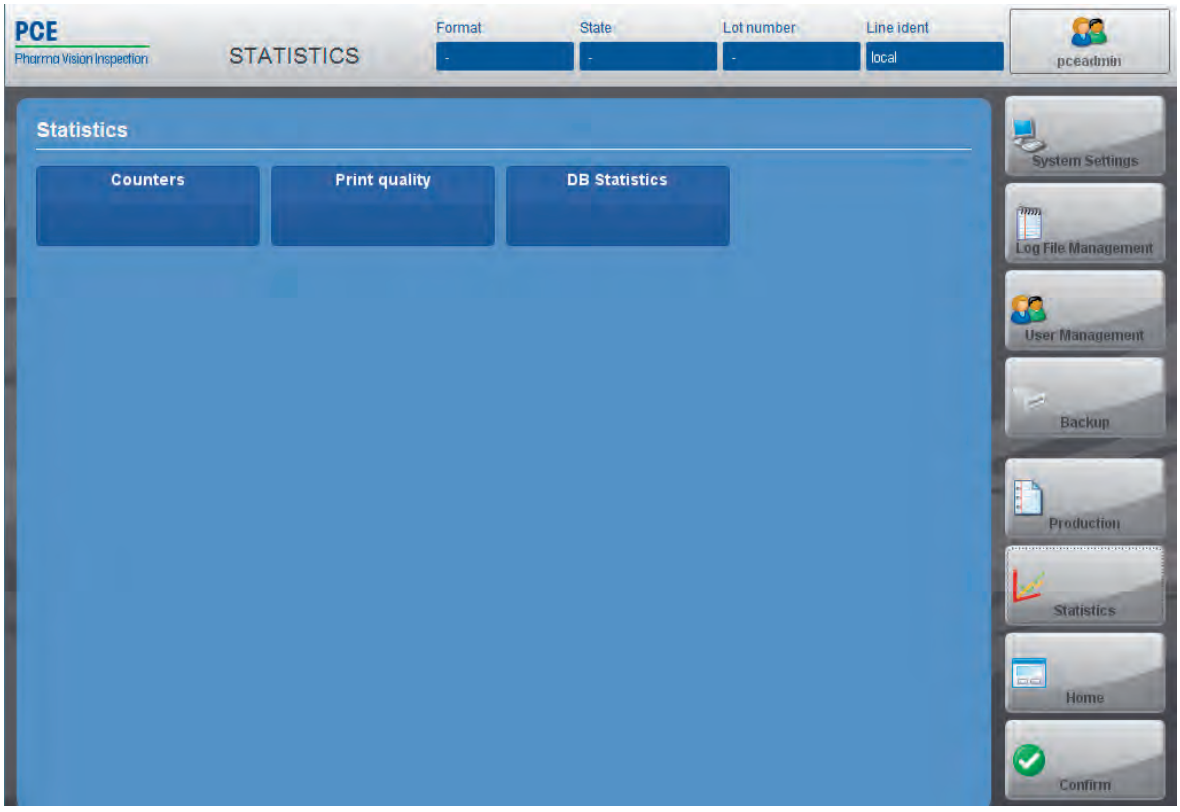


Figure: `Statistics`

From here you have the following options:

Name	Function
Counters	Counter statistics for good/bad units

Print quality	Counter statistics for good/bad units
DB Statistics	Counter statistics for checked and decommission products according to the various boxing ranks

11.2.1 Counters (A-3.10.2.1)

Figure: `Statistics > Counters`

Within this screen you can see the counters for the PLC and for the camera for each defined control window.

PLC:

- Products
- Reject

Camera:

- OCV error
- Data matrix error

The columns on the right side show trend parameters for the production.

11.2.2 Print Quality (A-3.10.2.2)

Figure: `Statistics > Print quality`

In this menu the statistics evaluation of the print quality verified by the camera can be seen.

The following codes can be evaluated by the camera:

- DM-Code according to ISO 15415-Standard (Quality A / B / C / D / F)
- Barcode 128 according to ISO 15416-Standard (Quality A / B / C / D / F)

There are several single parameters which in sum lead to the grade of the print quality. The columns on the right side show the trends for individual parameters.

Verification activation of print quality via the camera is carried out in the camera menu as described in the operating manual „Optical Character Reading".

11.2.3 Show Error Images (A-3.10.2.3)

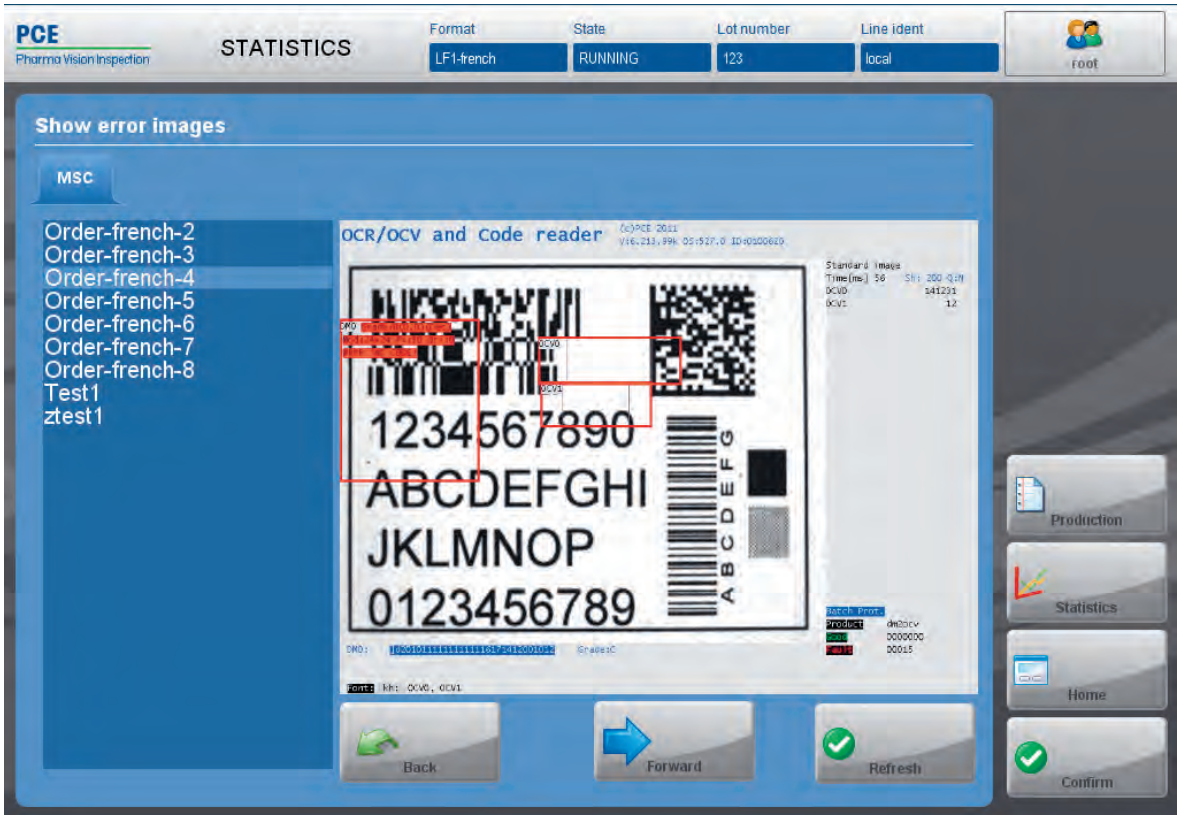


Figure: `Statistics > Show error images`

Within this menu you can see the pictures of the Smart Camera, which have led to an error evaluation.

11.2.4 Database Statistics

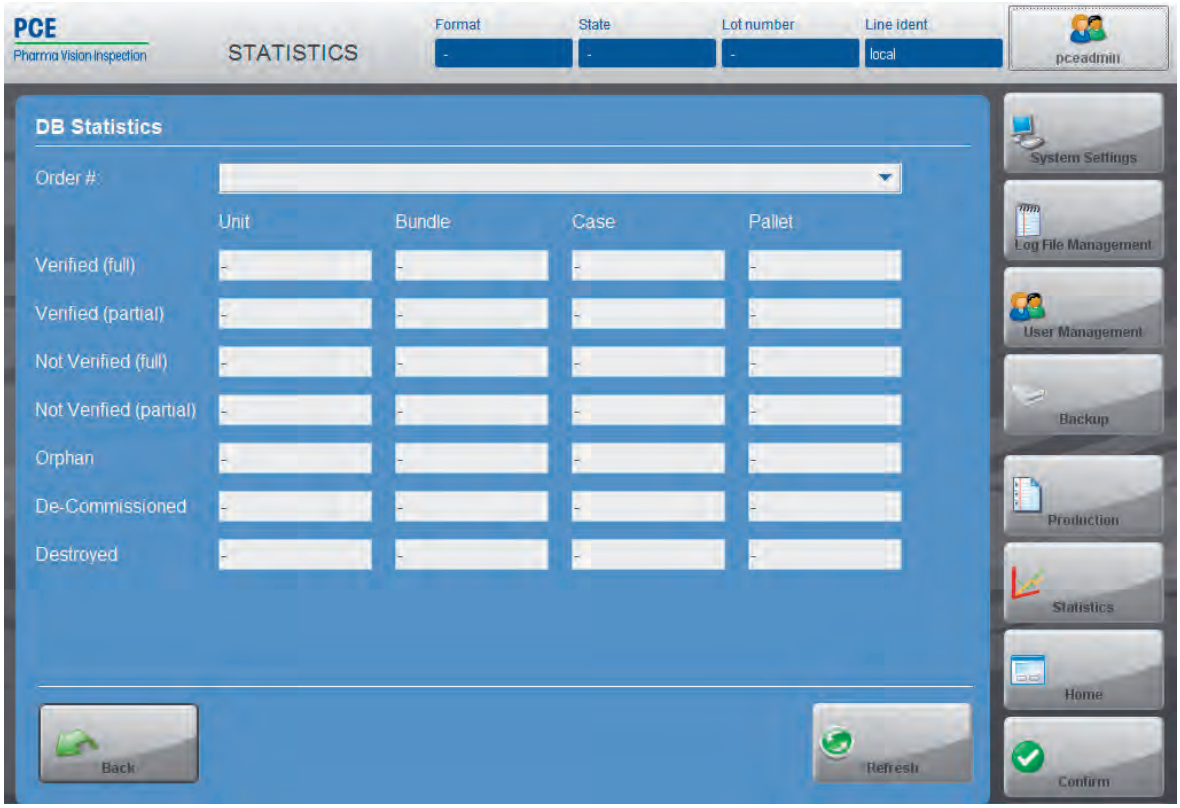


Figure: `Statistics > DB Statistics`

Within this menu you can see the number of checked and decommissioned products according to the various ranks (in serialization and aggregation only).

12 Backup and Restore Settings (A-3.11)

The Backup and Restore feature allows to create backups of the following data: Log File, Camera formats, Line Formats, System Settings, PLC Settings.

Note

Backup device settings

We recommend making a backup of all your device settings after all devices are setup and the line works errorless.

12.1 Backup Log File

In this menu you can set the data saving parameters in the Log.

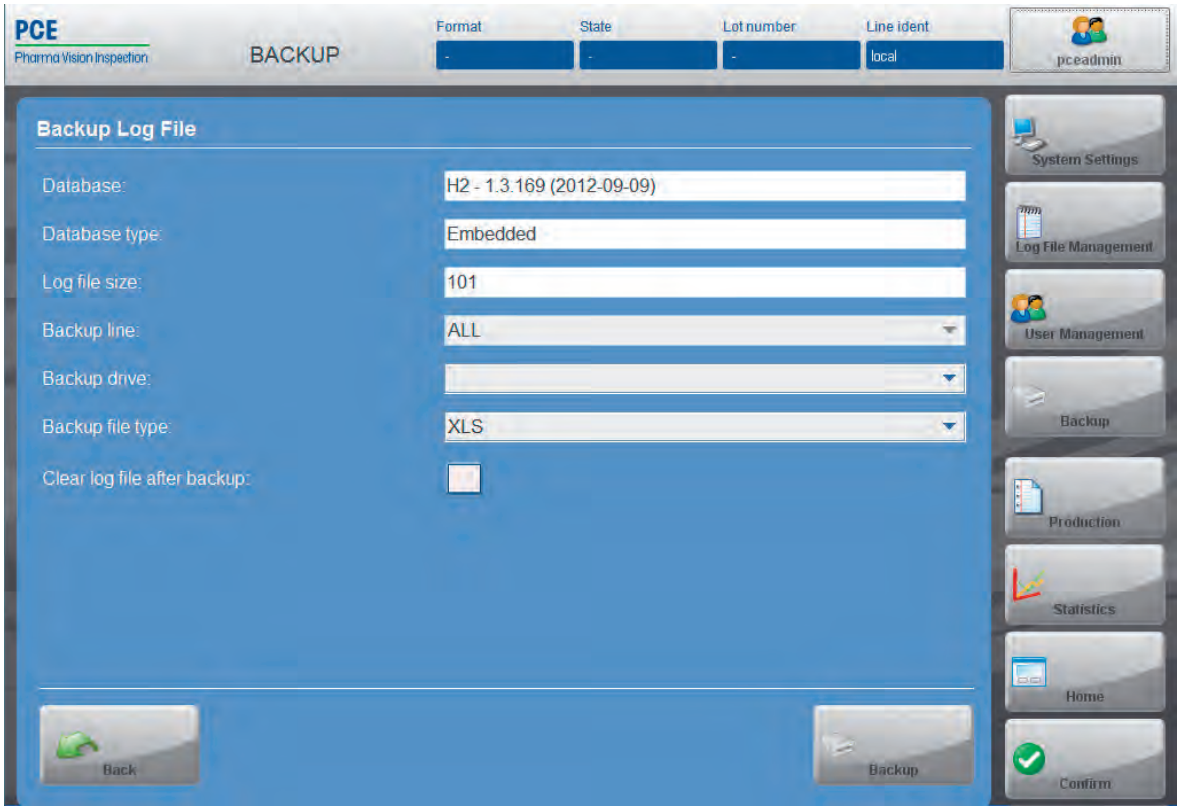


Figure: `Backup > Backup Lock File`

Fill in required fields and press `Backup`. The Log File will be stored onto the backup drive you have chosen.

12.2 Backup Camera Formats

To backup the camera formats press Backup > Backup Camera Formats. The following screen appears:

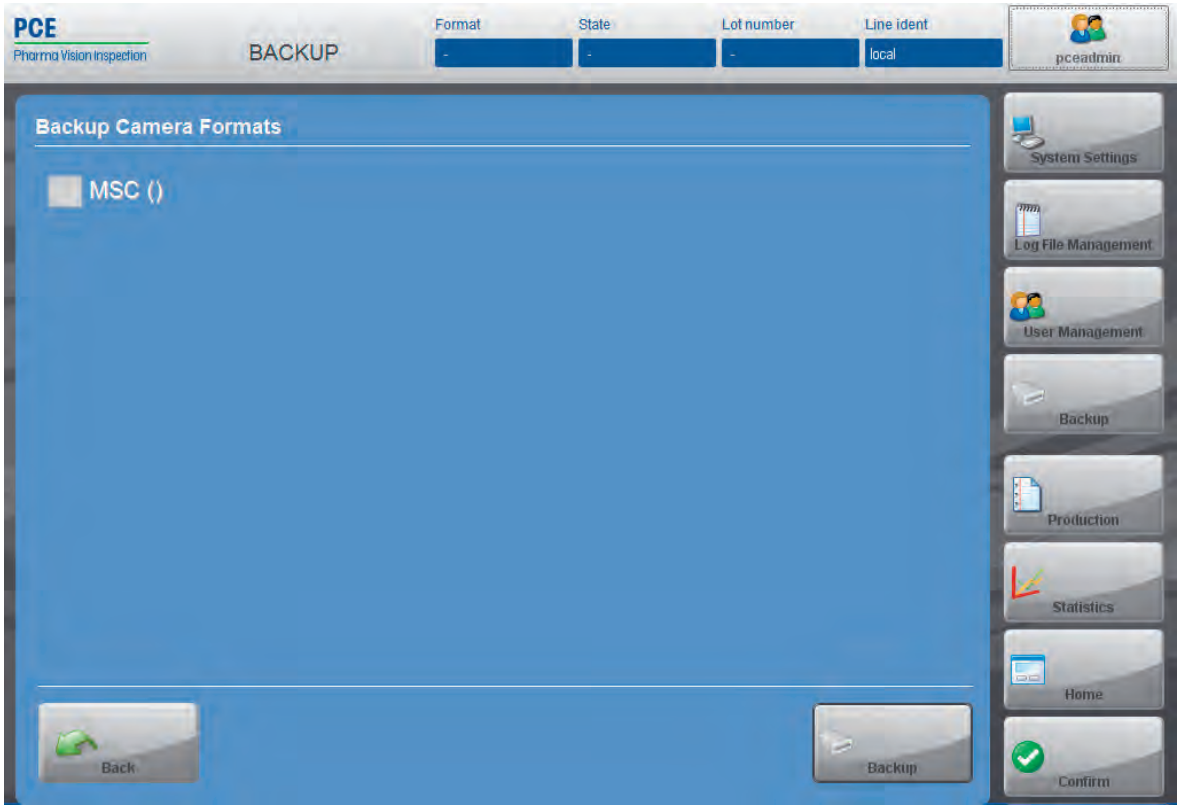


Figure: `Backup > Backup Camera Formats`

Select the cameras whose camera formats are to be saved and press `Backup`. The formats will be saved in the predefined path.

12.3 Backup Line Format

To backup the line format press Backup > Production > Add/Edit line format and select the format you want to save from the list and press `PDF report`.The formats will be saved in the predefined path. See the following screen:

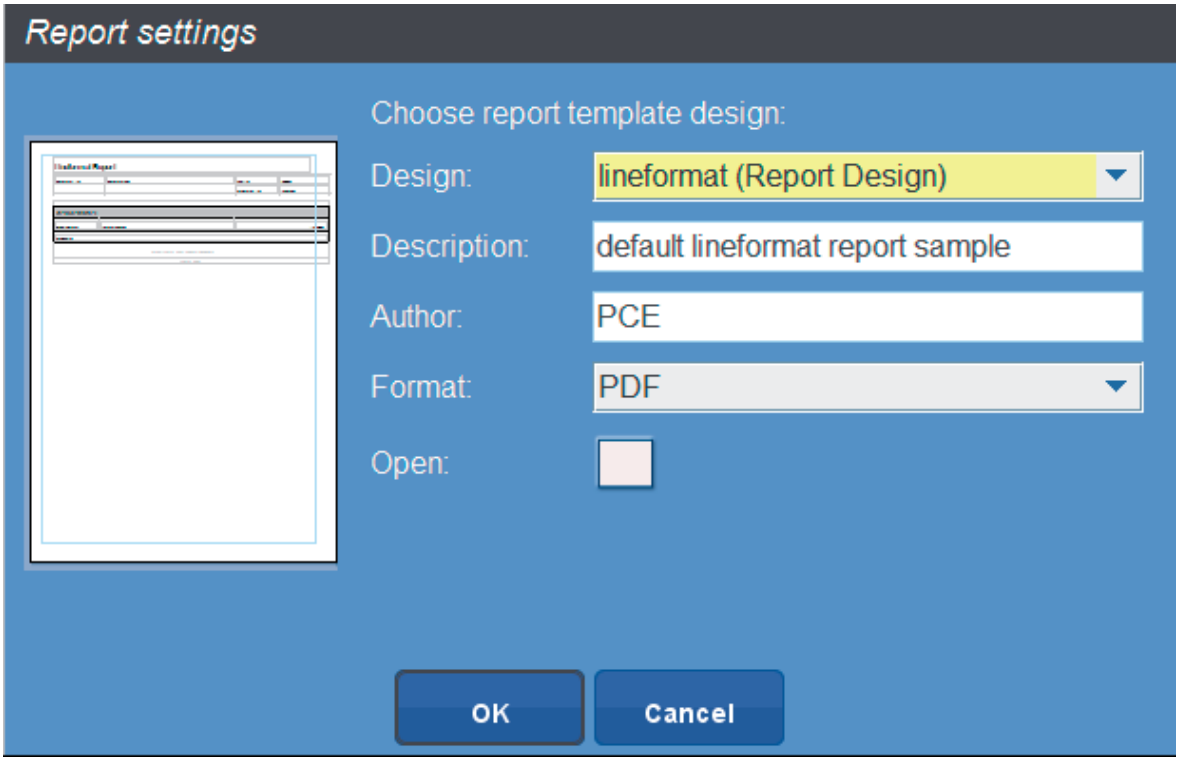


Figure: Production > Add/Edit line format > (Select format to save) > PDF report

12.4 Backup System Settings

To backup the System Settings press System Settings > System information > Save. The formats will be saved in the predefined path. See the following screen:

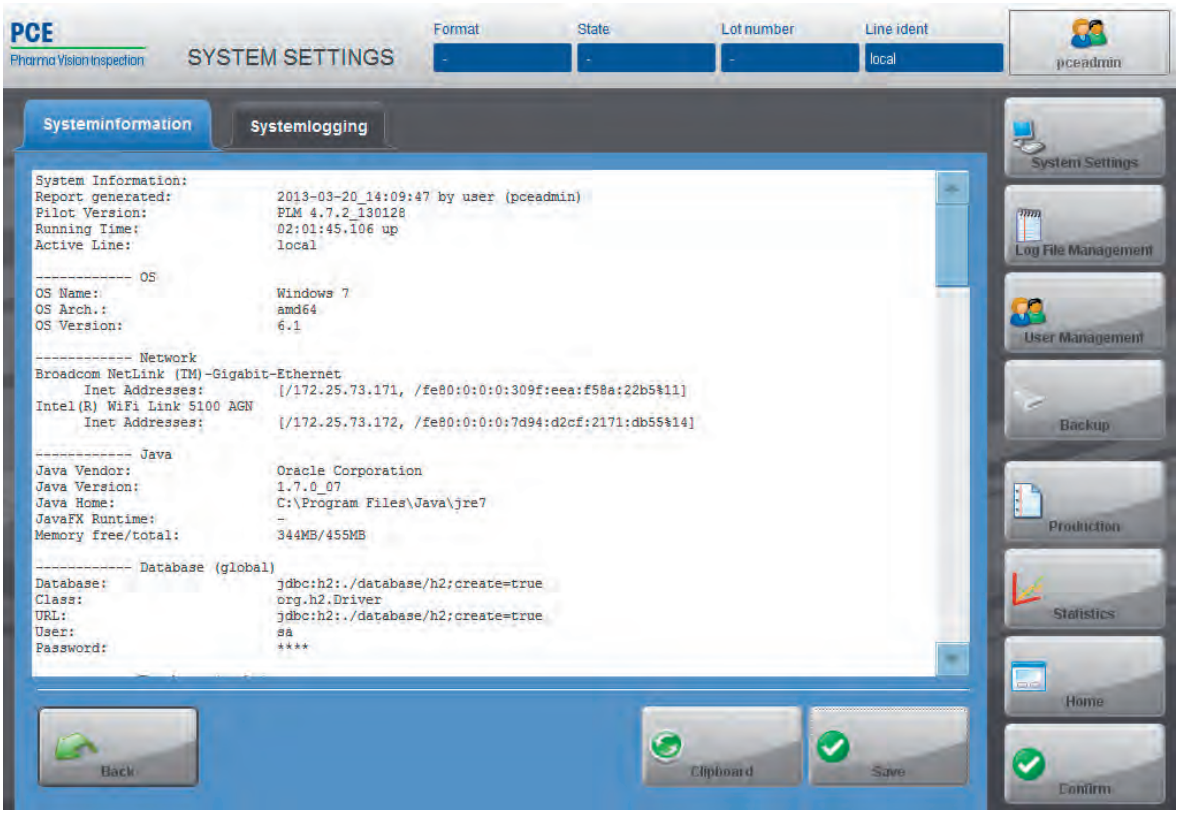


Figure: System Settings > System information > Save

12.5 Backup PLC Settings

To backup the PLC settings you must take screenshots of the settings screen. Press `System settings > Edit device Settings > (Select PLC.)` Scroll down until the bottom. The screen looks as follows:

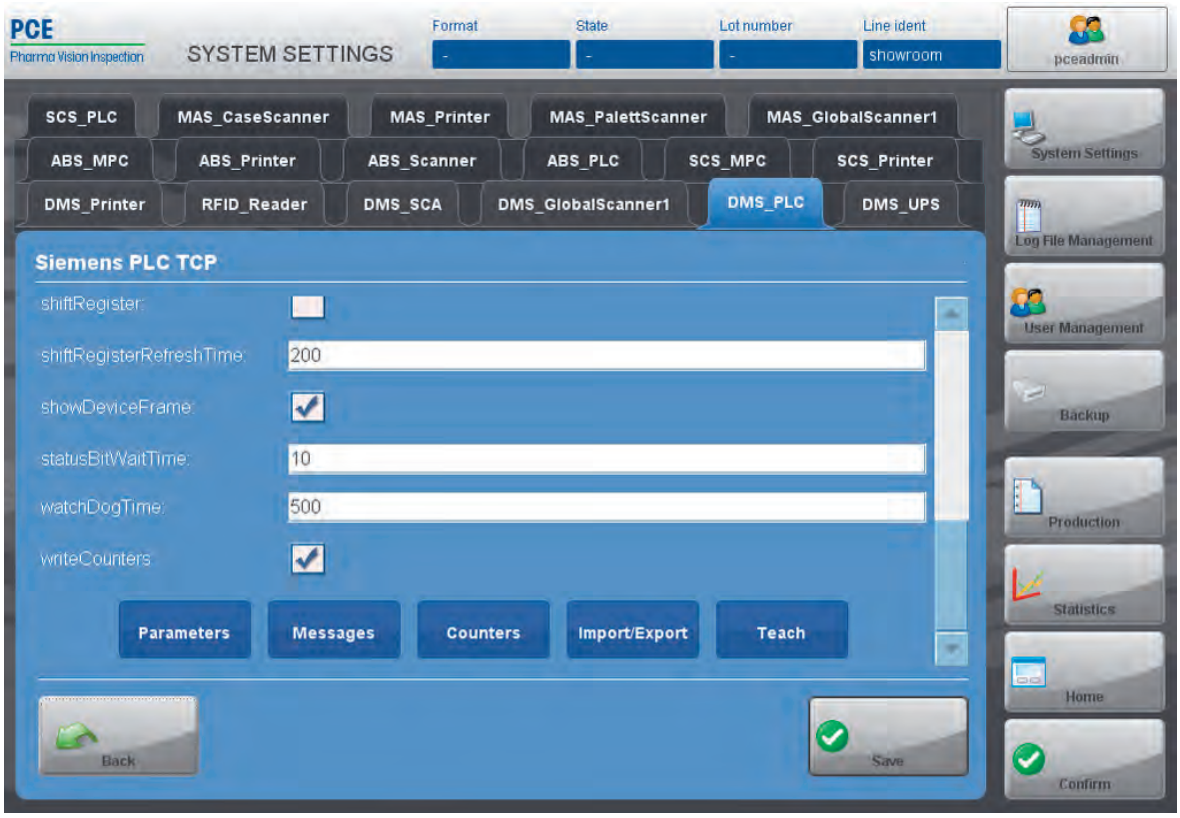


Figure: `System Settings > Edit device settings > (Select PLC)`

Press `Import/Export`. The screen looks as follows:

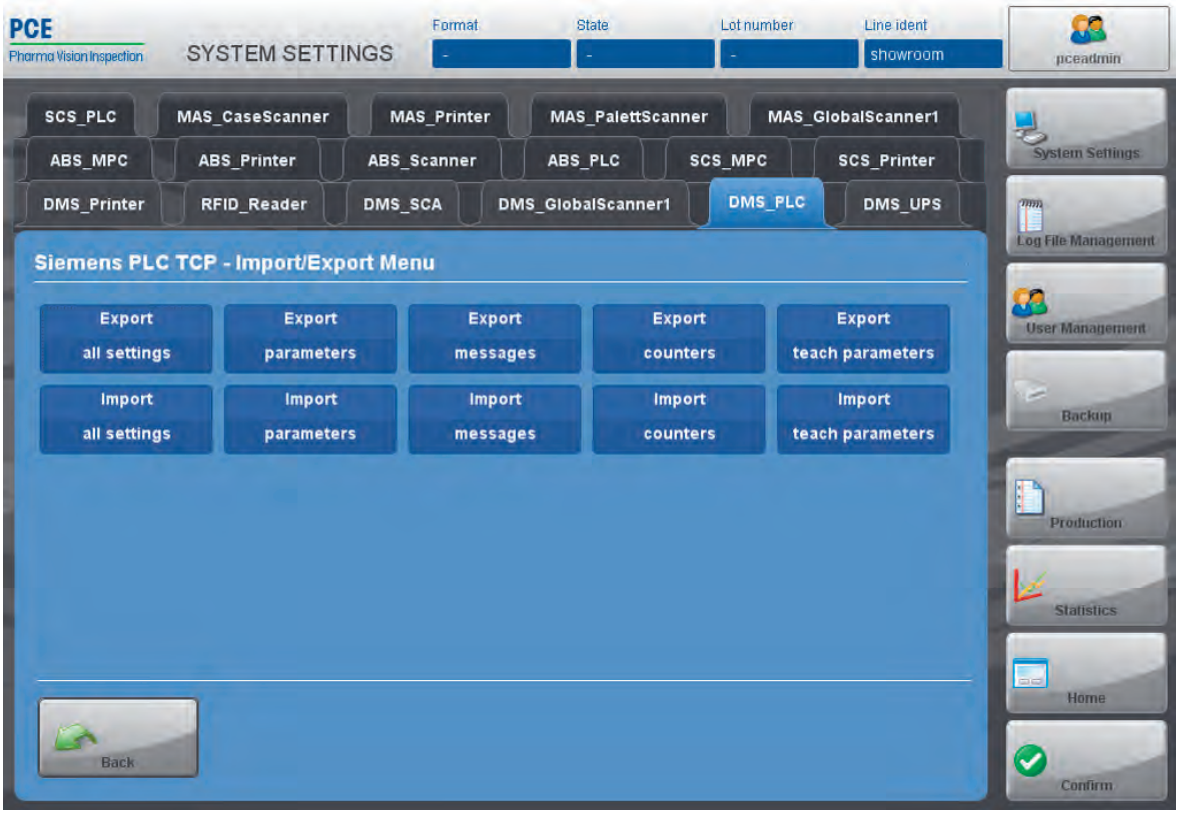


Figure: `System Settings > Edit device settings > (select PLC) > Press Import/Export`

Press `Export all settings.` For import of XML files see chapter: 6.2.6.1 (page 43)

12.6 Reestablishing the Default Settings of the Devices / System

You can reestablish the default settings of the system via the backup function. To open the `Backup` screen press `Backup`at the menu panel on the right hand side of the screen. The following screen appears:

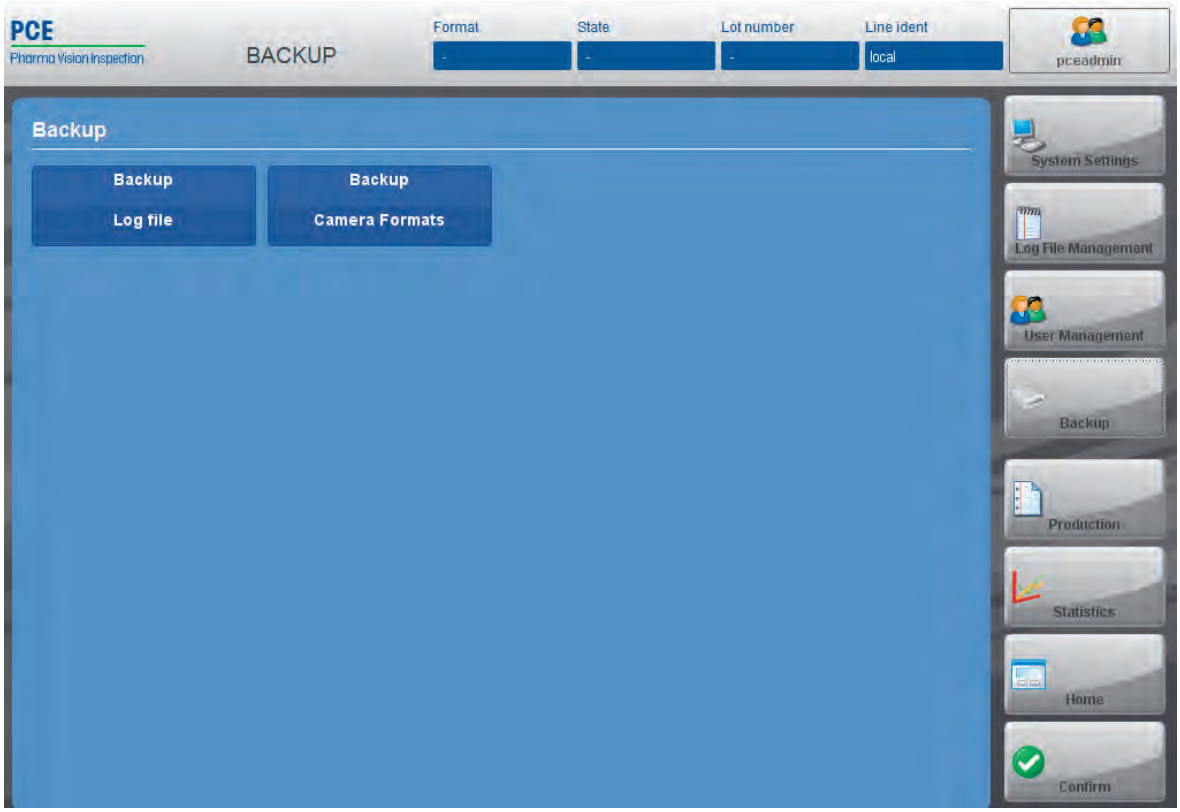


Figure: `Backup`

Select here whether you want to save the log file or the camera formats.

13 Alarms (A-3.12)

If an alarm occurs at the system or its components, it is shown on the status bar at the bottom of the screen. For information about the alarms and further actions see the Alarm List delivered with the technical documentation.

14 Appendix

14.1 User Rights Table (A-3.5.1.1)

This table lists the standard user groups. For each group, a user has been pre-defined. The pre-defined user names are written in lower case. Further user groups for PSM can be seen within PLM, but do not influence PLM usage. These groups are described within the PSM manual.

Furthermore, all user rights are listed. The level only impacts the Second Signature function.

User Right (applicable for)	**Description**	**Level 3** "administrator"	**Level 2** "engineer"	**Level 2** "supervisor" / "mechanic"	**Level 1** "operator"
General					
mayLogin (PLM)	User may login	yes	yes	yes	yes
mayChangePassword (PLM)	USER can change own password. The button is located in the menu "Login"	yes	yes	yes	yes
mayOpenDeviceFrame (PLM)	Button <Home> visible: USER may open device GUI	yes	yes	yes	yes
isSupervisor (PLM + PSM)	USER gets all user rights - Service mode	no	no	no	no
mayExitToOS (PLM)	USER may shut down the Pilot. System returns to Windows desktop.	yes	yes	no	no
mayShutDownPilot (PLM)	USER may shut down the Pilot. System returns to Windows logon screen	yes	yes	no	no
mayShutDownOS (PLM)	USER may shut down the system	yes	yes	no	no
mayRestartOS (PLM)	USER may restart the system	yes	yes	no	no
System Settings					
maySeeButton Sysconfig (PLM)	Button <System settings> visible: USER may enter the System Settings menu	yes	yes	no	no
mayEditSysSettings (PLM)	Button <Edit System Settings> visible: USER may edit system settings	yes	yes	no	no
maySeeSysInfo (PLM)	Button <System information> visible: User may open the system information.	yes	yes	no	no
mayEditDeviceTable (PLM)	Button <Create/Edit Device> visible: USER may create/edit devices	yes	yes	no	no
mayEditDeviceSettings (PLM)	Button <Edit Device Settings> visible: USER may edit devices settings	yes	yes	no	no

Camera A (PLM)	Camera menu: USER may create, delete and rename products	yes	yes	yes	no
Camera B (PLM)	Camera menu: USER may delete and rename fonts	yes	yes	yes	no
Camera C (PLM)	Camera menu: USER may start/stop the lot protocol	yes	yes	yes	no
Camera D (PLM)	Camera menu: USER may set the reference code	yes	yes	no	no
Camera E (PLM)	Camera menu: USER may change the product	yes	yes	yes	no
Camera F (PLM)	Camera menu: USER may access the product management	yes	yes	yes	no
Camera G (PLM)	Camera menu: USER may change fonts	yes	yes	yes	no
Camera H (PLM)	Camera menu: USER may access the service level	yes	yes	no	no
Camera I (PLM)	Camera menu: USER may switch on/off the camera	yes	yes	no	no
Camera J (PLM)	Camera menu: USER may access the write protection/approval	yes	yes	no	no
Camera K (PLM)	Camera menu: USER may access the camera menu	yes	yes	yes	no
maySwitchLine (PLM)	Button <Switch Line> visible: USER may switch between connected lines	no	no	no	no
mayEditSysGlobals (PLM)	USER may edit global system settings	no	no	no	no
maySeeSecSigConfig (PLM)	Buttons: <Second signature configurations> visible. USER may configure second signature.	no	no	no	no
scaleLevel1 (PLM)	USER gets the OCS-checkweigher-rights Level 1	no	no	no	no
scaleLevel2 (PLM)	USER gets the OCS-checkweigher-rights Level 2	no	no	no	no
scaleLevel3 (PLM)	USER gets the OCS-checkweigher-rights Level 3	no	no	no	no

maySeeERPOverXMLImport (PLM)	USER can configure xPath for ERP data import	no	no	no	no
MPAdmin (PLM)	Megapixel administrator	no	no	no	no
MPProductmanager (PLM)	Megapixel product manager	no	no	no	no
MPLineoperator (PLM)	Megapixel operator	no	no	no	no
maySeeMonthNameList (PLM)	USER can edit Month-Name List	no	no	no	no
Logfile					
maySeeButtonLogfile (PLM)	Button <Logfile> visible: USER may see and print the Logfile	yes	yes	yes	yes
maySeeButtonBackup (PLM)	Button <Backup> visible: USER may backup the camera	yes	yes	no	no
mayResetLogfile (PLM)	USER can delete Logfile	no	no	no	no
User Management					
maySeeButtonUSERManager (PLM)	Button <User Management> visible: USER may enter the User Management menu	yes	no	no	no
maySeeButtonGroups (PLM)	Button <Groups> visible: USER may enter the user groups menu, to create/edit/delete user groups	yes	no	no	no
maySeeButtonRights (PLM)	Button <Rights> visible: USER may enter the user rights menu, to create/edit/delete user right settings	yes	no	no	no
maySeeAllUsers (PLM)	USER may see all registered users	yes	no	no	no
mayAddUsers (PLM + PSM)	USER may add users	yes	no	no	no
mayDeleteUsers (PLM + PSM)	USER may delete users	yes	no	no	no
mayChangeUsers (PLM + PSM)	USER may change user settings	yes	no	no	no
Statistics					
useStatistics (PLM)	Button <Statistics> visible: USER may access the statistics menu	yes	yes	yes	yes
useStatisticsCounter (PLM)	Button <Statistics: Counters> visible: USER may access the counters statistics panel	yes	yes	yes	yes

useStatisticsPQuality (PLM)	Button <Statistics: Print quality> visible: USER may access the print quality statistics	yes	yes	yes	yes
maySeeErrorImages (PLM)	User can see camera error images	yes	yes	yes	yes
maySeeButtonRemove ErrorImages (PLM)	Button <Remove Error Images> visible. USER may delete error images.	no	no	no	no
Production					
maySeeButton Production (PLM)	Button <Production> visible: USER may enter the production menu	yes	yes	yes	yes
maySeeButtonOrder Testrun (PLM)	Button <Order Testrun> visible.	no	no	no	no
mayStartProdOrder (PLM)	Button <Start Production via Order> visible: USER may start production via order	yes	yes	yes	yes
mayStartTestRun (PLM)	Button <TestRun via Line Format> visible: USER may start a test run	yes	yes	yes	no
mayStopProdOrder (PLM)	Button <Finish> visible: USER may stop and close orders	yes	yes	yes	yes
mayEditOrder (PLM + PSM)	Button <Create/edit Order> visible: USER may create and edit orders	yes	yes	yes	yes
mayEditLineformat (PLM)	Button <Create/Edit Line Format> visible: USER may create and edit line formats	yes	yes	yes	no
mayEditProducts (PLM + PSM)	Button <Add/Edit Product> visible: USER may create and edit products	yes	yes	no	no
mayPrintOrderResult (PLM)	Button <Order Result - Create Report> visible: USER may see and print the order reports	yes	yes	yes	yes
mayEditAppIdTable (PLM)	Button <AI Management> visible: USER may edit GS1 Application Identifier list	yes	no	no	no
mayAddOrderData (PLM)	Button <Add OrderData> visible: USER may add orderdata manually	no	no	no	no

maySleepProdOrder (PLM)	Button <Sleep> visible: USER may enter production menu while production is suspended	no	no	no	no
mayEditAppIdType (PLM)	Button <AI Management> visible: USER may edit GS1 Application Identifier type	no	no	no	no
mayResetOrder (PLM + PSM)	Button <Reset Order> visible: USER may reset status of orders	no	no	no	no
mayVerifyUnits (PLM)	USER may commission folding boxes with the hand scanner.	no	no	no	no
mayDeleteOrders (PLM + PSM)	USER may delete workorders	no	no	no	no
maySeeButtonOrderMove (PLM + PSM)	Button <Move order to line> visible: USER may move order to a different line.	no	no	no	no
Serialization/ Aggregation					
mayAggOverload (PLM)	USER may overload aggregation units	no	no	no	no
mayOrderSN (PLM)	USER may order serial numbers	no	no	no	no
mayEditNumberRanges (PLM)	USER may edit serial no. ranges	no	no	no	no
mayBookUnits (PLM)	USER may commission and decommission (serial no.)	no	no	no	no
mayDeaggUnits	USER may deaggregate packaging units	no	no	no	no
maySeeAggCloseExist (PLM)	USER may see aggregation button to finalize parents and print label	no	no	no	no
maySeeAggHir (PLM)	USER may see hierarchy screen	no	no	no	no
maySeeAggInfo (PLM)	USER may see hand scanner information screen	no	no	no	no
maySeeAggList	USER may see hand scanner aggregation screen	no	no	no	no
maySeeAggOpenExist (PLM)	USER may see aggregation button to open and edit exist parents	no	no	no	no
mayXmitOrderResult (PLM)	USER may send production data to SAP	no	no	no	no
useSQLAdminManager (PLM)	USER may use SQL admin panel	no	no	no	no

mayDestroyUnits (PLM)	User may destroy Aggregation of Units.	no	no	no	no
accessPSA (PSM)	USER may login at PSM	no	no	no	no
mayAddAIs (PSM)	User may add new application identifiers	no	no	no	no
mayEditAIs (PSM)	User may edit new application identifiers and define dependencies between AIs	no	no	no	no
mayDeactivateAIs (PSM)	User may activate/deactivate application identifiers	no	no	no	no
mayAddOrders (PSM)	User may create new orders	no	no	no	no
mayAddProducts (PSM)	User may add new products	no	no	no	no
mayDeleteProducts (PSM)	User may delete products	no	no	no	no
mayAddLines (PSM)	User may add new lines	no	no	no	no
mayEditLines (PSM)	User may edit lines	no	no	no	no
mayDeleteLines (PSM)	User may delete lines	no	no	no	no
mayAddLineformat (PSM)	User may add lineformat	no	no	no	no
mayDeleteLineformat (PSM)	User may delete lineformat	no	no	no	no
mayAddLineSettings (PSM)	User may add linesettings	no	no	no	no
mayEditLineSettings (PSM)	User may edit lnesettings	no	no	no	no
mayDeleteLineSettings (PSM)	User may delete linesettings	no	no	no	no
mayAddGroups (PSM)	User may add groups	no	no	no	no
mayDeleteGroups	User may delete groups	no	no	no	no
mayEditGroups (PSM)	User may edit groups	no	no	no	no
mayExportAuditTrailAs PDF (PSM)	User may export audit trail as PDF file	no	no	no	no
mayPrintAuditTrail (PSM)	User may export audit trail via Printer	no	no	no	no
mayExportAuditTrailAs Excel (PSM)	User may export audit trail as Excel file	no	no	no	no

mayEditModuleSettings (PSM)	User may change PSM module settings	no	no	no	no
mayExportOrders (PSM)	User may export Orders to ERP System	no	no	no	no
mayAddGTINNumbers (PSM)	User may register new GTIN Numbers in PSM	no	no	no	no
mayEditGTINNumbers	User may edit GTIN Numbers in PSM	no	no	no	no
mayAddSSCCNumbers (PSM)	User may register new SSCC Numbers in PSM	no	no	no	no
mayEditSSCCNumbers (PSM)	User may edit existing SSCC Numbers in PSM	no	no	no	no
mayAddProdCode Numbers (PSM)	User may register new ProdCode Numbers in PSM	no	no	no	no
mayEditProdCode Numbers (PSM)	User may edit existing ProdCode Numbers in PSM	no	no	no	no
mayImportSerial Numbers (PSM)	User may import serial numbers	no	no	no	no
mayChangeEmail NotificationSettings	User may change email - Notification Settings	no	no	no	no
mayChangeActive DirectorySettings (PSM)	User may change Active Directory Settings	no	no	no	no
mayRunTestProduction (PSM)	User may access Test Production Generator in PSM	no	no	no	no
mayAssignLineformat (PSM)	User may add lineformat to Order	no	no	no	no

14.2 Device Classes

Class	Description
AC_NG2	Printer
APS	Printer
AZOmega	Printer
AveryPEM	Printer
BluhmWeberJet	Printer
DOMINO_D3	Printer
DOMINO_V3	Printer
Datalogic_Scanner	Handheld Scanner
Etipack_Plus	Printer
FEIG_OBID	RFID
FEIG_OBID_Writer	RFID
Honeywell_Metro	Handheld Scanner
Honeywell_Scanner	Handheld Scanner
Imaje7031	Printer
KBAMetronic	Printer

LinxLaserSL301	Printer
Logopak_VLP110	Printer
MI_Cimjet	Printer
MI_Labelpoint	Printer
MI_SmartDate5	Printer
Metronic_AJC	Printer
Metronic_AJD	Printer
OCS_Weigher	Checkweigher
OpenDate	Printer
PCE_ABSPLC	PLC
PCE_DB_WATCHDOG	Tool
PCE_DIALOG	Tool
PCE_EMAIL_NOTIFICATION	Tool
PCE_MPC	Reader
PCE_MPC_VDMAXML	Reader
PCE_MSC	Reader
PCE_MSC_PRC	Reader
PCE_PLC	PLC
PCE_PSM_Exporter	Tool
PCE_VGL6	Reader
PCE_VGL7	Reader
PCE_VGL8	Reader
Pago	Printer
Palletizer_Extension	Tool
Rea_HRpro	Printer
Redcube	Printer
Rockwell_PLC	PLC
Sato_e_Pro	Printer
Siemens_PLC_MPI	PLC
Siemens_PLC_PPI	PLC
Siemens_PLC_TCPIP	PLC
Snitcher	PLC
TampoPrint_SPS	Printer
UPS	UPS
VJ_1510CIJ	Printer
VideoJetDataflex	Printer
Wolke_m600_Advanced	Printer
Zebra_170xiIII	Printer

14.3 AI Management (A-3.7.2.12)

Within this menu you can adapt the Pilot Line Manager to your particular requirements. If the checkmark in the column 'enable' is set, the application identifier (AI) is activated, will be recognized and can be used by the PLM. To edit the AI Management settings press `Production > AI Management`.

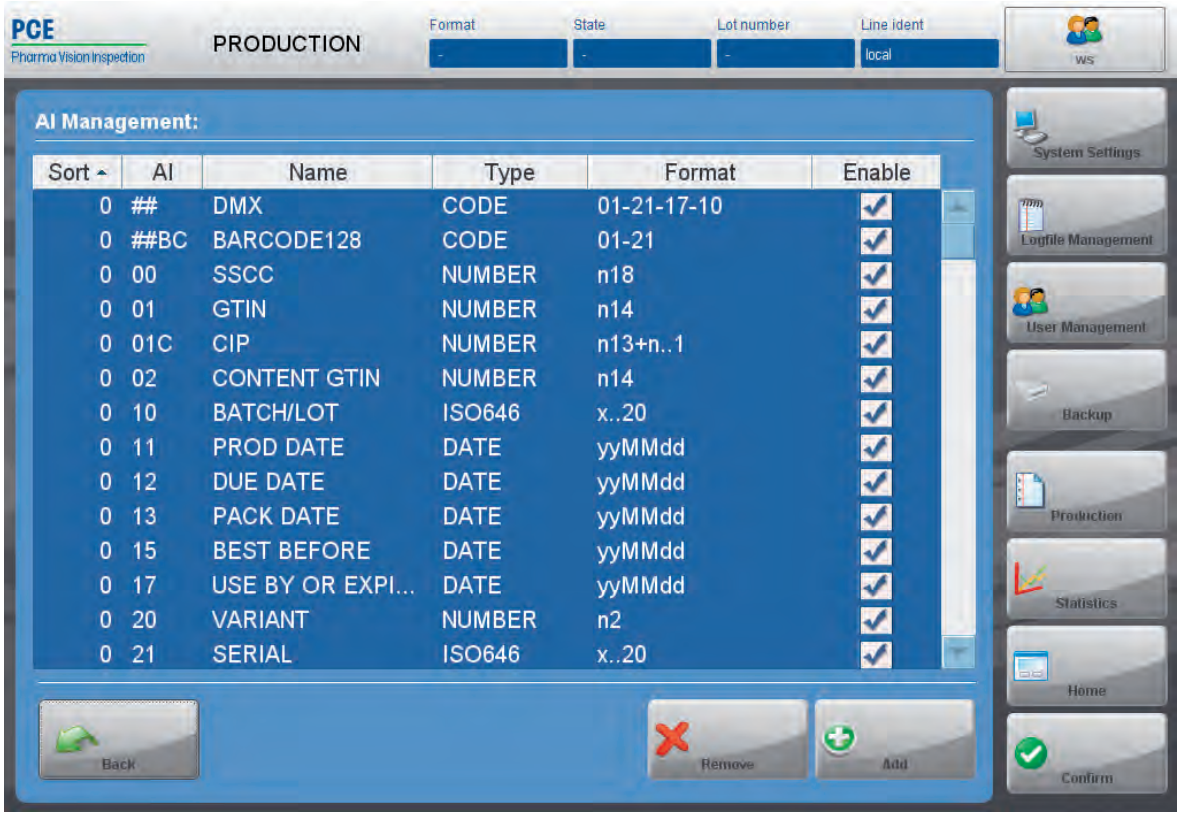


Figure: `Production > AI Management`

List of Application Identifiers

AI	Name	Description	Min	Max	Type	Format
##	DMX	Datamatrix Code	0	255	CODE	01-21-17-10
##BC	GS1 BARCODE128	GS1-128 Barcode	0	255	CODE	01-21
##CO	CODE128	CODE-128 Barcode	0	255	CODE	
##HR	HUMAN READABLE	Human Readable Text	0	255	CODE	01-21
##RF	RFID EPC	EPC Code	0	255	CODE	
##AS	ASSEMBLE	AI assembling data field	0	255	CODE	
00	SSCC	SSCC (Serial Shipping Container Code)	18	18	NUMBER	n18
01	GTIN	Global Trade Item NUMBER (GTIN)	14	14	NUMBER	n14
01C	CIP	Club Inter-Pharmaceutique	13	14	NUMBER	n13+n..1
02	CONTENT GTIN	GTIN of Contained Trade Items	14	14	NUMBER	n14
10	BATCH/LOT	Batch or Lot NUMBER	0	20	ISO646	x..20
11	PROD DATE	Production DATE (YYMMDD)	7	10	DATE	yyMMdd
12	DUE DATE	Due DATE (YYMMDD)	7	10	DATE	yyMMdd
13	PACK DATE	Packaging DATE (YYMMDD)	7	10	DATE	yyMMdd
15	BEST BEFORE	Best Before DATE (YYMMDD)	7	10	DATE	yyMMdd

17	USE BY OR EXPIRY	Expiration DATE (YYMMDD)	7	10	DATE	yyMMdd
20	VARIANT	Variant NUMBER	2	2	NUMBER	n2
21	SERIAL	Serial NUMBER	0	20	ISO646	x..20
22	QTY /DATE /BATCH	Secondary Data Fields	0	29	CODE	30(5)-17 (MMyy)-10
30	VAR. COUNT	Count of Items (Variable Measure Trade Item)	0	8	NUMBER	n..8
37	CONTENT SIZE	Number of Units Contained	0	8	NUMBER	n..8
90 … 99	INTERNAL	Information Mutually Agreed Between Trading Partners	0	30	ISO646	x..30
240	ADDITIONAL ID	Additional Item Identification	0	30	ISO646	x..30
241	CUST. PART NO.	Customer Part NUMBER	0	30	ISO646	x..30
242	MTO VARIANT	Made-to-Order Variation NUMBER	0	6	NUMBER	n..6
243	PCN	Packaging Component Number	0	20	ISO646	x..20
250	SECONDARY SERIAL	Secondary Serial NUMBER	0	30	ISO646	x..30
251	REF. TO SOURCE	Reference to Source Entity	0	30	ISO646	x..30
253	GDTI	Global Document Type Identifier (GDTI)	13	30	NUMBER	n13+n..17
254	GLN EXTENSION	GLN Extension Component	0	20	ISO646	x..20
255	GCN	Global Coupon Number (GCN)	13	25	NUMBER	n13+n..12
310Y	NET WEIGHT (kg)	Net weight, kilograms (Variable Measure Trade Item)	6	7	DECIMAL	n6
311Y	LENGTH (m)	Length of first dimension, metres (Variable Measure Trade Item	6	7	DECIMAL	n6
312Y	WIDTH (m)	Width, diametre, or second dimension, metres (Variable Measure Trade Item)	6	7	DECIMAL	n6
313Y	HEIGHT (m)	Depth, thickness, height, or third dimension, metres (Variable Measure Trade Item)	6	7	DECIMAL	n6
314Y	AREA (m^2)	Area, square metres (Variable Measure Trade Item)	6	7	DECIMAL	n6
315Y	NET VOLUME (l)	Net volume, litres (Variable Measure Trade Item)	6	7	DECIMAL	n6
316Y	NET VOLUME (m^3)	Net volume, cubic metres (Variable Measure Trade Item)	6	7	DECIMAL	n6
320Y	NET WEIGHT (lb)	Net weight pounds (Variable Measure Trade Item)	6	7	DECIMAL	n6
321Y	LENGTH (i)	Length or first dimension, inches (Variable Measure Trade Item)	6	7	DECIMAL	n6
322Y	LENGTH (f)	Length or first dimension, feet (Variable Measure Trade Item)	6	7	DECIMAL	n6

323Y	LENGTH (y)	Length or first dimension, yards (Variable Measure Trade Item)	6	7	DECIMAL	n6
324Y	WIDTH (i)	Width, diametre, or second dimension, inches (Variable Measure Trade Item)	6	7	DECIMAL	n6
325Y	WIDTH (f)	Width, diametre, or second dimension, feet (Variable Measure Trade Item)	6	7	DECIMAL	n6
326Y	WIDTH (y)	Width, diametre, or second dimension, yards (Variable Measure Trade Item	6	7	DECIMAL	n6
327Y	HEIGHT (i)	Depth, thickness, height, or third dimension, inches (Variable Measure Trade Item)	6	7	DECIMAL	n6
328Y	HEIGHT (f)	Depth, thickness, height, or third dimension, feet (Variable Measure Trade Item)	6	7	DECIMAL	n6
329Y	HEIGHT (y)	Depth thickness, height, or third dimension, yards (Variable Measure Trade Item)	6	7	DECIMAL	n6
330Y	GROSS WEIGHT (kg)	Logistic weight, kilograms	6	7	DECIMAL	n6
331Y	LENGTH (m), log	Length or first dimension, metres	6	7	DECIMAL	n6
332Y	WIDTH (m), log	Width, diametre, or second dimension, metres	6	7	DECIMAL	n6
333Y	HEIGHT (m), log	Depth, thickness, height, or third dimension, metres	6	7	DECIMAL	n6
334Y	AREA (m^2), log	Area, square metres	6	7	DECIMAL	n6
335Y	VOLUME (l), log	Logistic volume, litres	6	7	DECIMAL	n6
336Y	VOLUME (m^3), log	Logistic volume, cubic litres	6	7	DECIMAL	n6
337Y	KG PER m^2	Kilograms per square metre	6	7	DECIMAL	n6
340Y	GROSS WEIGHT (lb)	Logistic weight, pounds	6	7	DECIMAL	n6
341Y	LENGTH (i), log	Length or first dimension, inches	6	7	DECIMAL	n6
342Y	LENGTH (f), log	Length or first dimension, feet	6	7	DECIMAL	n6
343Y	LENGTH (y), log	Length or first dimension, yards	6	7	DECIMAL	n6
344Y	WIDTH (i), log	Width, diametre, or second dimension	6	7	DECIMAL	n6
345Y	WIDTH (f), log	Width, diametre, or second dimension	6	7	DECIMAL	n6
346Y	WIDTH (y), log	Width, diametre, or second dimension	6	7	DECIMAL	n6
347Y	HEIGHT (i), log	Depth, thickness, height, or third dimension	6	7	DECIMAL	n6
348Y	HEIGHT (f), log	Depth, thickness, height, or third dimension	6	7	DECIMAL	n6

349Y	HEIGHT (y), log	Depth, thickness, height, or third dimension	6	7	DECIMAL	n6
350Y	AREA (i^2)	Area, square inches (Variable Measure Trade Item)	6	7	DECIMAL	n6
351Y	AREA (f^2)	Area, square feet (Variable Measure Trade Item)	6	7	DECIMAL	n6
352Y	AREA (y^2)	Area, square yards (Variable Measure Trade Item)	6	7	DECIMAL	n6
353Y	AREA (i^2), log	Area, square inches	6	7	DECIMAL	n6
354Y	AREA (f^2), log	Area, square feet	6	7	DECIMAL	n6
355Y	AREA (y^2), log	Area, square yards	6	7	DECIMAL	n6
356Y	NET WEIGHT (t)	Net weight, troy ounces (Variable Measure Trade Item)	6	7	DECIMAL	n6
357Y	NET VOLUME (oz)	Net weight (or volume), ounces (Variable Measure Trade Item)	6	7	DECIMAL	n6
360Y	NET VOLUME (q)	Net volume, quarts (Variable Measure Trade Item)	6	7	DECIMAL	n6
361Y	NET VOLUME (g)	Net volume, gallons U.S. (Variable Measure Trade Item)	6	7	DECIMAL	n6
362Y	VOLUME (q), log	Logistic volume, quarts	6	7	DECIMAL	n6
363Y	VOLUME (g), log	Logistic volume, gallons U.S.	6	7	DECIMAL	n6
364Y	VOLUME (i^3)	Net volume, cubic inches (Variable Measure Trade Item)	6	7	DECIMAL	n6
365Y	VOLUME (f^3)	Net volume, cubic feet (Variable Measure Trade Item)	6	7	DECIMAL	n6
366Y	VOLUME (y^3)	Net volume, cubic yards (Variable Measure Trade Item)	6	7	DECIMAL	n6
367Y	VOLUME (i^3), log	Logistic volume, cubic inches	6	7	DECIMAL	n6
368Y	VOLUME (f), log	Logistic volume, cubic feet	6	7	DECIMAL	n6
369Y	VOLUME (y), log	Logistic volume, cubic yards	6	7	DECIMAL	n6
390Y	AMOUNT	Applicable Amount Payable, local currency	0	16	DECIMAL	n..15
391Y	AMOUNT	Applicable Amount Payable with ISO Currency Code	3	19	DECIMAL	n3+n..15
392Y	PRICE	Applicable Amount Payable, single monetary area (Variable Measure Trade Item)	0	16	DECIMAL	n..15
393Y	PRICE	Applicable Amount Payable with ISO Currency Code (Variable Measure Trade Item)	3	19	DECIMAL	n3+n..15
400	ORDER NUMBER	Customer's Purchase Order NUMBER	0	30	ISO646	x..30
401	GINC	Consignment NUMBER	0	30	ISO646	x..30

402	GSIN	Shipment Identification NUMBER	17	17	NUMBER	n17
403	ROUTE	Routing Code	0	30	ISO646	x..30
410	SHIP TO LOC	Ship to - Deliver to Global Location NUMBER	13	13	NUMBER	n13
411	BILL TO	Bill to - Invoice to Global Location NUMBER	13	13	NUMBER	n13
412	PURCHASE FROM	Purchased from Global Location NUMBER	13	13	NUMBER	n13
413	SHIP FOR LOC	Ship for - Deliver for - Forward to Global Location NUMBER	13	13	NUMBER	n13
414	LOC No	Identification of a Physical Location - Global Location NUMBER	13	13	NUMBER	n13
415	PAY TO	Global Location NUMBER of the Invoicing Party	13	13	NUMBER	n13
420	SHIP TO POST	Ship to - Deliver to Postal Code Within a Single Postal Authority	0	20	ISO646	x..20
421	SHIP TO POST	Ship to - Deliver to Postal Code with ISO Country Code	3	12	ISO646	n3+x..9
422	ORIGIN	Country of Origin of a Trade Item	3	3	NUMBER	n3
423	COUNTRY - INITIAL PROCESS.	Country of Initial Processing	3	15	NUMBER	n3+n..12
424	COUNTRY - PROCESS.	Country of Processing	3	3	NUMBER	n3
425	COUNTRY - DISASSEMBLY	Country of Disassembly	3	3	NUMBER	n3
426	COUNTRY – FULL PROCESS	Country Covering full Process Chain	3	3	NUMBER	n3
427	ORIGIN SUBDIVISION	Country Subdivision of Origin	0	3	ISO646	x..3
710	NHRN PZN	National Healthcare Reimbursement Number (NHRN) – Germany PZN	0	20	ISO646	x..20
711	NHRN CIP	National Healthcare Reimbursement Number (NHRN) – France CIP	0	20	ISO646	x..20
712	NHRN CN	National Healthcare Reimbursement Number (NHRN) – Spain CN	0	20	ISO646	x..20
7001	NSN	NATO Stock NUMBER (NSN)	13	13	NUMBER	n13
7002	MEAT CUT	UN/ECE Meat Carcasses and Cuts Classification	0	30	ISO646	x.. 30
7003	EXPIRY TIME	Expiration Date and Time	14	14	NUMBER	n4+n10
7004	ACTIVE POTENCY	Active Potency	4	8	NUMBER	n4+n.. 4
7030 … 7039	PROCESSOR # 0 … # 9	Approval NUMBER of Processor with ISO Country Code	3	30	ISO646	n3+x.. 27
8001	DIMENSIONS	Roll Products (Width, Length, Core Diametre, Direction, Splices)	14	14	NUMBER	n14
8002	CMT No	Cellular Mobile Telephone Identifier	0	20	ISO646	x..20

8003	GRAI	Global Returnable Asset Identifier (GRAI)	14	30	ISO646	n14+x..16
8004	GIAI	Global Individual Asset Identifier (GIAI)	0	30	ISO646	x.. 30
8005	PRICE PER UNIT	Price Per Unit of Measure	6	6	NUMBER	n6
8006	GCTIN	Identification of the Components of a Trade Item	18	18	NUMBER	n14+n2+n2
8007	BAN	International Bank Account NUMBER (IBAN)	0	30	ISO646	x.. 30
8008	PROD TIME	DATE and Time of Production	8	12	DATETIME	yyyyMMddHHmm
8010	CPID	Global Service Relation Number (GSRN)	0	30	ISO646	x.. 30
8011	CPID SERIAL	Global Service Relation Number (GSRN)	0	12	NUMBER	n..12
8017	GSRN - PROVIDER	Global Service Relation Number (GSRN)	18	18	NUMBER	n18
8018	GSRN-RECIPIENT	Global Service Relation NUMBER (GSRN)	18	18	NUMBER	n18
8019	SRIN	Service Relation Instance Number (SRIN)	0	10	NUMBER	n..10
8020	REF No	Payment Slip Reference NUMBER	0	25	ISO646	x.. 25
8100	-	GS1-128 Coupon Extended Code	6	6	NUMBER	n6
8101	-	GS1-128 Coupon Extended Code	10	10	NUMBER	n1+n5+n4
8102	-	GS1-128 Coupon Extended Code	2	2	NUMBER	n1+n1
8110	-	Coupon Code Identification for Use in North America	0	30	ALNUM	an..30
8200	PRODUCT URL	Extended Packaging URL	0	70	ISO646	x..70
R00	RANK NAME	Rank Description	0	10	STRING	x..20
R01	SER ALGO	Serialization Algorithm	0	10	STRING	x..10
R02	SER PREFIX	Fix Serial Prefix	0	20	ISO646	x..20
R03	SER LENGTH	Serial Number Length	0	2	NUMBER	n2
R04	SSCC PACK ID	SSCC pack type	0	1	NUMBER	n1
R05	COMP PREFIX	Company Prefix	0	9	NUMBER	n..9
R06	PROD QUANTITY	Target production quantity	0	10	NUMBER	n..10
R07	PROD NAME	External Product Name	0	64	STRING	x..64
R08	ORDER NAME	External Order Name	0	64	STRING	x..64
R09	LINEFORMAT NAME	External Lineformat Name	0	64	STRING	x..64
R10	LINE NAME	External Line Name	0	64	STRING	x..64
R11	PRODUCT DESCRIPTION	External Product Description	0	64	STRING	x..64
R12	SN POOL MINIMUM THRESHOLD	Minimum threshold for an SN range	0	9	NUMBER	n..9
R13	SN POOL MAXIMUM THRESHOLD	Maximum threshold for an SN range	0	9	NUMBER	n..9
R14	SN POOL LINE BUFFER	Pool line buffer for an SN range	0	9	NUMBER	n..9
R15	OrderUnit LAST CHANGED	last changed Date	7	10	DATE	yyMMdd
R16	ORDER DESCRIPTION	External Order Description	0	64	STRING	x…64

R17	RND TAIL LEN	randomized serial suffix length	0	2	NUMBER	n..2
R18	PRODUCT CODE	common product code	0	20	ISO646	x…20
R21	HELPER CODE	Helpercode Number	0	20	ISO646	x…20
R23	HC LENGTH	Helpercode Number Length	0	2	NUMBER	n2
R25	SSCC PREFIX	Combined R04 and R05	0	10	NUMBER	n..10
R36	LAYER SIZE	Content Layer Size	0	10	NUMBER	n..10
R37	CONTENT COUNT	Real Content Size	0	10	NUMBER	n..10
R38	PRODCODE POOL MIN	pool minimum for product code serial list or ranges	0	10	NUMBER	n..10
R39	PRODCODE POOL MAX	pool maximum for product code sserial list or ranges	0	10	NUMBER	n..10
R40	SGTIN POOL MIN	pool minimum for sgtin ranges	0	10	NUMBER	n..10
R41	SGTIN POOL MAX	pool maximum for sgtin ranges	0	10	NUMBER	n..10
R42	SSCC POOL MIN	pool minimum for sscc ranges	0	10	NUMBER	n..10
R43	SSCC POOL MAX	pool maximum for sscc ranges	0	10	NUMBER	n..10
R44	SGTIN POOL LINE	pool line for sgtin ranges	0	10	NUMBER	n..10
R45	SSCC POOL LINE	pool line for sscc ranges	0	10	NUMBER	n..10
R46	PRODCODE POOL LINE	pool line for product code serial list or ranges	0	10	NUMBER	n..10
B01	AIC	AIC Code	9	9	NUMBER	n9
B02	BOLLINI	Bollini Vignette	9	9	NUMBER	n9
B03	BELG_CODE	Belgium Vignette	15	15	NUMBER	n15
CH01	PRODUCT CODE	china product code	0	20	NUMBER	n..20
CH02	RESOURCE CODE	china resource code	0	20	NUMBER	n..20
CH03	SUB TYPE	china sub type	0	10	NUMBER	n..10
CH04	ACTOR	china actor	0	20	STRING	x..20
CH05	CORP ORDER ID	china corp. order ID	0	20	STRING	x..20
CH06	TO CORP ID	china to corp. ID	0	20	STRING	x..20
CH07	PACKAGE RATIO	china package ratio	0	20	STRING	x..20
CH08	CODE VERSION	china code version	0	5	NUMBER	x..5
CH09	PackageSpec	package specification for chinaexport	0	5	NUMBER	x..5
CH10	Workshop	Workshop for chinaexport	0	20	STRING	x..20
CH11	LineManager	LineManager for chinaexport	0	20	STRING	x..20
CH12	FromCorpID	FromCorpID for chinaexport	0	20	STRING	x..20
CH13	DrugType	drug type for chinaexport	0	20	STRING	x..20
CH14	Comment	comment for chinaexport	0	20	STRING	x..20
CH15	alternateCorpOrderID	CorpOrderID for chinaexport	0	20	STRING	x..20
8P	PPN_GTIN	Global Trade Item Number (PPN)	14	14	NUMBER	n14
1T	PPN_LOT	Batch or Lot Number (PPN)	0	20	ISO646	x..20
D	PPN_EXP_DATE	Expiration DATE (PPN)[YYMMDD]	6	10	DATE	yyMMdd

16D	PPN_MANF_DATE	Manufacturing DATE (PPN)[YYYYMMDD]	8	10	DATE	yyyyMMdd
S	PPN_SERIAL	Serial Number (PPN)	0	20	ALNUM	an..20
9N	PPN	Pharmacy Product Number (PPN)	4	22	ALNUM	an..22
PZN7	PZN_7	Pharmazentralnummer (7)	7	7	NUMBER	n7
PZN8	PZN_8	Pharmazentralnummer (8)	8	8	NUMBER	n8
X01 … X20		Custom Value 01 … 20	0	25-5	STRING	x..255

Fields based on Application Identifiers can be defined with "Regular Expressions" (see chapter 13 (page 187)).

Fields based on date values can be defined with Month name lists (MNL) and with Date time patterns (see chapter 13 (page 187)).

14.4 Regular Expressions

Construct	Matches
Characters	
x	The character x
\\	The backslash character
\0n	The character with octal value 0n (0 <= n <= 7)
\0nn	The character with octal value 0nn (0 <= n <= 7)
\0mnn	The character with octal value 0mnn (0 <= m <= 3, 0 <= n <= 7)
\xhh	The character with hexadecimal value 0xhh
\uhhhh	The character with hexadecimal value 0xhhhh
\t	The tab character ('\u0009')
\n	The newline (line feed) character ('\u000A')
\r	The carriage-return character ('\u000D')
\f	The form-feed character ('\u000C')
\a	The alert (bell) character ('\u0007')
\e	The escape character ('\u001B')
\cx	The control character corresponding to x
Character classes	
[abc]	a, b, or c (simple class)
[^abc]	Any character except a, b, or c (negation)
[a-zA-Z]	a through z or A through Z, inclusive (range)
[a-d[m-p]]	a through d, or m through p: [a-dm-p] (union)
[a-z&&[def]]	d, e, or f (intersection)
[a-z&&[^bc]]	a through z, except for b and c: [ad-z] (subtraction)
[a-z&&[^m-p]]	a through z, and not m through p: [a-lq-z](subtraction)
Predefined character classes	
.	Any character (may or may not match line terminators)
\d	A digit: [0-9]
\D	A non-digit: [^0-9]
\s	A whitespace character: [\t\n\x0B\f\r]
\S	A non-whitespace character: [^\s]
\w	A word character: [a-zA-Z_0-9]
\W	A non-word character: [^\w]
POSIX character classes (US-ASCII only)	
\p{Lower}	A lower-case alphabetic character: [a-z]
\p{Upper}	An upper-case alphabetic character:[A-Z]
\p{ASCII}	All ASCII:[\x00-\x7F]
\p{Alpha}	An alphabetic character:[\p{Lower}\p{Upper}]

\p{Digit}	A decimal digit: [0-9]
\p{Alnum}	An alphanumeric character:[\p{Alpha}\p{Digit}]
\p{Punct}	Punctuation: One of !"#$%&'()*+,-./:;<=>?@[\]^_`{|}~
\p{Graph}	A visible character: [\p{Alnum}\p{Punct}]
\p{Print}	A printable character: [\p{Graph}\x20]
\p{Blank}	A space or a tab: [\t]
\p{Cntrl}	A control character: [\x00-\x1F\x7F]
\p{XDigit}	A hexadecimal digit: [0-9a-fA-F]
\p{Space}	A whitespace character: [\t\n\x0B\f\r]
java.lang.Character classes (simple java character type)	
\p{javaLowerCase}	Equivalent to java.lang.Character.isLowerCase()
\p{javaUpperCase}	Equivalent to java.lang.Character.isUpperCase()
\p{javaWhitespace}	Equivalent to java.lang.Character.isWhitespace()
\p{javaMirrored}	Equivalent to java.lang.Character.isMirrored()
Classes for Unicode blocks and categories	
\p{InGreek}	A character in the Greek block (simple block)
\p{Lu}	An uppercase letter (simple category)
\p{Sc}	A currency symbol
\P{InGreek}	Any character except one in the Greek block (negation)
[\p{L}&&[^\p{Lu}]]	Any letter except an uppercase letter (subtraction)
Boundary matchers	
^	The beginning of a line
$	The end of a line
\b	A word boundary
\B	A non-word boundary
\A	The beginning of the input
\G	The end of the previous match
\Z	The end of the input but for the final terminator, if any
\z	The end of the input
Greedy quantifiers	
X?	X, once or not at all
X*	X, zero or more times
X+	X, one or more times
X{n}	X, exactly n times
X{n,}	X, at least n times
X{n,m}	X, at least n but not more than m times
Reluctant quantifiers	
X??	X, once or not at all
X*?	X, zero or more times
X+?	X, one or more times
X{n}?	X, exactly n times
X{n,}?	X, at least n times
X{n,m}?	X, at least n but not more than m times
Possessive quantifiers	
X?+	X, once or not at all
X*+	X, zero or more times
X++	X, one or more times
X{n}+	X, exactly n times
X{n,}+	X, at least n times
X{n,m}+	X, at least n but not more than m times
Logical operators	
XY	X followed by Y

XIY	Either X or Y
(X)	X, as a capturing group
Back references	
\n	Whatever the nth capturing group matched
Quotation	
\	Nothing, but quotes the following character
\Q	Nothing, but quotes all characters until \E
\E	Nothing, but ends quoting started by \Q
Special constructs (non-capturing)	
(?:X)	X, as a non-capturing group
(?idmsux-idmsux)	Nothing, but turns match flags i d m s u x on - off
(?idmsux-idmsux:X)	X, as a non-capturing group with the given flags i d m s u x on - off
(?=X)	X, via zero-width positive lookahead
(?!X)	X, via zero-width negative lookahead
(?<=X)	X, via zero-width positive lookbehind
(?<!X)	X, via zero-width negative lookbehind
(?>X)	X, as an independent, non-capturing group

14.5 Date Values

MNL01: JAN;FEB;MRZ;APR;MAI;JUN;JUL;AUG;SEP;OKT;NOV;DEZ

MNL02: Jan;Feb;Mrz;Apr;Mai;Jun;Jul;Aug;Sep;Okt;Nov;Dez

MNL03: Jan.;Feb.;Mar.;Apr.;May;June;July;Aug.;Sept.;Oct.;Nov.;Dec.

MNL04: Q1;Q1;Q1;Q2;Q2;Q2;Q3;Q3;Q3;Q4;Q4;Q4

Letter	Date or Time Component	Presentation	Examples
G	Era designator	Text	AD
y	Year	Year	1996; 96
Y	Week year	Year	2009; 09
M	Month in year	Month	July; Jul; 07
w	Week in year	Number	27
W	Week in month	Number	2
D	Day in year	Number	189
d	Day in month	Number	10
F	Day of week in month	Number	2
E	Day name in week	Text	Tuesday; Tue
u	Day number of week (1 = Monday, ..., 7 = Sunday)	Number	1
a	Am/pm marker	Text	PM
H	Hour in day (0-23)	Number	0
k	Hour in day (1-24)	Number	24
K	Hour in am/pm (0-11)	Number	0
h	Hour in am/pm (1-12)	Number	12
m	Minute in hour	Number	30
s	Second in minute	Number	55
S	Millisecond	Number	978
z	Time zone	General time zone	Pacific Standard Time; PST; GMT-08:00
Z	Time zone	RFC 822 time zone	-0800
X	Time zone	ISO 8601 time zone	-08; -0800; -08:00

Examples:

Date and Time Pattern	Result
"yyyy.MM.dd G 'at' HH:mm:ss z"	2001.07.04 AD at 12:08:56 PDT

"EEE, MMM d, ''yy"	Wed, Jul 4, '01
"h:mm a"	12:08 PM
"hh 'o''clock' a, zzzz"	12 o'clock PM, Pacific Daylight Time
"K:mm a, z"	0:08 PM, PDT
"yyyyy.MMMMM.dd GGG hh:mm aaa"	02001.July.04 AD 12:08 PM
"EEE, d MMM yyyy HH:mm:ss Z"	Wed, 4 Jul 2001 12:08:56 -0700
"yyMMddHHmmssZ"	010704120856-0700
"yyyy-MM-dd'T'HH:mm:ss.SSSZ"	2001-07-04T12:08:56.235-0700
"yyyy-MM-dd'T'HH:mm:ss.SSSXXX"	2001-07-04T12:08:56.235-07:00

14.6 Supported Printers

The printers in the list below are supported:

Printer type	**Manufacturer**	**Type**
DOD Drop On Demand	Wolke	m600 advanced
	APS apsolute	apsolute V1
	REA	REA Jet
	Atlantic Zeiser	Omega i36
CIJ Continuous Ink Jet	KBA-Metronic	Alphajet C
	Videojet VJ 1510	Videojet VJ 1510
CO2-Laser	Domino	Dynamark
	KBA-Metronic	K-1000 SP / PLUS (10/30 Watt)
	Macsa	
	Markem Imaje	7031 / 7031S
	Videojet	VJ 3120, VJ 3320, VJ 3430
	Linx	SL101, SL301
	Alltec	LC100, LC300, LC500
TTO Thermal Transfer Overhead	Markem Imaje	SmartDate5
		CIMJET 334
	Videojet	Dataflex Plus
	AC Codiergeräte	NG2
	Avery Dennison	Avery PEM
	Logopak	VLP110
	Zebra	170xiIII, 170Xi4
	Zebra	R110Xi4
	Zebra	R110PAX4
	Sato	M8490Se, CL608e

14.7 Abbreviations and Terms

ABS	Advanced Bundle Station
AIs	Application Identifiers (AI)
Auto-Logout	Logged in Pilot Line Manager users will be automatically logged out after a certain period of inactivity. This period can be set in the system settings. This prevents unauthorized access to areas protected by the authorization system.
Order report	A report issued after the end of production, which contains the batch data and a statistic for the monitoring results (good/total) of the individual monitoring devices.
COM	Serial interfaces for bidirectional data transfer between the PC and peripheral devices.
DB	Database
DMS	Datamatrix Station

FDA 21 CFR Part 11	FDA is the abbreviation for Food and Drug Administration, which is an organization of the US Department of Health and Human Services. The FDA makes regulations for manufacturers of pharmaceutical and food products in order to protect the health of the consumers. It also checks for compliance with these regulations. CFR is the abbreviation for Code of Federal Regulations. All of the regulations of the American legal system are contained in this massive document. The number 21 is the short form for Title 21, Chapter I and the number 11 is the abbreviated designation for Part 11. Part 11 deals with electronic records and electronic signatures. The full title is: Code of Federal Regulations: Food and Drug Administration Title 21, Chapter I, Part 11-Electronic Records; Electronic Signatures
ERP-System	Enterprise Resource Planning System (typically order transaction
GS1	Global Standards One
Item	An item is the smallest unit at the aggregation process. This can be a folding box or a blister. It is usually aggregated to a bundle or directly to a shipping case.
LAN	Local Area Network, network for data exchange between devices
Log file	Automatically generated record file
MAS	Manual Aggregation Station
HRC-AI Software	**High Resolution Camera** Software of the **HRC**.
OCV	Optical Character Verification
PCE	Pharmacontrol Electronic GmbH
PLM	Pilot Line Manager
PLC	Programmable logic controller
PSM	Pilot Site Manager
Rank	At each aggregation rank, unambiguous assignment of units to parent-child aggregation levels is done.
RS232	Standard for a serial interface
SMC	Smart Camera
SCS	Shipping Case Station
SVS	Supervisor-Station
TCP/IP	Transmission Control Protocol/Internet Protocol. A protocol combination that combines transport and routing in one network connection.
Unit	A unit is the result of an aggregation level. The term unit is used for an item, a bundle, a shipping case or a pallet
VDMA	Association of German Mechanical and Systems Engineers
VDMAXML_P	Norm for the integration of intelligent components in packaging machines and processing machines: data exchange structuring with regard to the standards of 21 CFR 11, Standardized Communication (VDMAXML_P Version 1.0)

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